E 21 200 E

SYNTHESIS

International Journal of Methods in Synthetic Organic Chemistry

Georg Thieme Publishers Stuttgart

Index 1978

EASTERN MICHIGAN UNIVERSITY
LIBRARY
AUG 14 1979
SCIENCE & TECHNOLOGY

INTERNATIONAL JOURNAL OF METHODS
IN SYNTHETIC ORGANIC CHEMISTRY

1978

SYNTHESIS

REVIEWS · COMMUNICATIONS · ABSTRACTS

EDITORS

G. SCHILL, Freiburg/Br.

G. SOSNOVSKY, Milwaukee/Wis.

H. J. ZIEGLER, Basel

ADVISORY BOARD

D. H. R. BARTON, Gif-sur-Yvette
K. BERNAUER, Basel
H. C. BROWN, Lafayette/Ind.
E. J. COREY, Cambridge/Mass.
H. HELLMANN, Marl
W. S. JOHNSON, Stanford/Calif.
M. I. KABACHNIK, Moscow
J. MATHIEU, Romainville
W. P. NEUMANN, Dortmund
R. ODA, Kyoto
G. A. OLAH, Los Angeles/Calif.
E. G. ROZANTSEV, Moscow
H. E. SIMMONS, Wilmington/Del.
F. SONDHEIMER, London
F. ŠORM, Prague
H. A. STAAB, Heidelberg
E. E. VAN TAMELEN, Stanford/Calif.
K. WEISSERMEL, Frankfurt/Main
R. WEST, Madison/Wis.
G. WILKE, Mülheim/Ruhr

EDITORIAL OFFICE

R. E. DUNMUR, W. LÜRKEN
P. O. Box 732 · Herdweg 63 · D-7000 Stuttgart 1
Phone 0711/21481 · Telex 721942
Cable address: Thiemebuch Stuttgart

GEORG THIEME VERLAG · STUTTGART

© 1979 Georg Thieme Verlag, Stuttgart, Herdweg 63 – Printed in Germany – Druck: Zechnersche Buchdruckerei, Speyer.

SYNTHESIS 1978

Reviews

Baiocchi, L., Corsi, G., Palazzo, G.: Synthesis, Properties, and Reactions of 1*H*-Indazol-3-ols and 1,2-Dihydro-3*H*-indazol-3-ones 633

Corsi, G., see Baiocchi, L. 633

Fatiadi, A.J.: New Applications of Malononitrile in Organic Chemistry; Part I 165

New Applications of Malononitrile in Organic Chemistry; Part II 241

Field, L.: Some Developments in Synthetic Organic Sulfur Chemistry Since 1970 713

Knorr, H., Ried, W.: Die präparative Chemie der Cyclobutendione; II. Reaktionen von Alkyl-, Alkenyl- und Arylcyclobutendionen 649

Krapcho, A.P.: Synthesis of Carbocyclic Spiro Compounds via Cycloaddition Routes 77

Lenz, G.R.: The Photochemistry of Enamides . . . 489

Majoral, J.P.: Synthesis and Reactions of Heterocyclic Compounds Containing a P–N–N-Linkage 557

Oppolzer, W.: Intramolecular Cycloaddition Reactions of *ortho*-Quinodimethanes in Organic Synthesis 793

Palazzo, G., see Baiocchi, L. 633

Ried, W., see Knorr, H. 649

see Schmidt, A.H. 1, 869

Rossi, R.: Insect Pheromones; II. Synthesis of Chiral Components of Insect Pheromones . . . 413

Schmidt, A.H., Ried, W.: Die präparative Chemie der Cyclobutendione; I. Synthese von Cyclobutendion und dessen Alkyl-, Alkenyl- und Aryl-Derivaten 1

Die präparative Chemie der Cyclobutendione; III. Synthese von Quadratsäure, Benzocyclobutendion und deren Derivaten 869

Scott, J.W., see Valentine, D. 329

Sharma, S.: Thiophosgene in Organic Synthesis 803

Valentine, D., Scott, J.W.: Asymmetric Synthesis 329

Communications

Abe, N., see Miyano, S. 451

Aben, R.W., Scheeren, J.W.: Synthesis of β-Hydroxy Esters from Ketene Acetals and Aldehydes or Ketones. An Acidic Alternative for the Reformatsky Reaction and Crossed Aldol Condensation 400

Adam, W., Arias Encarnacion, L., Fick, H.H.: Generation of the Lithium α-Benzyloxy- and α,α-Diphenoxy-α-lithioacetate Synthons and Their Alkylation 828

Agarwal, N.L., Jain, S.K.: A Novel Route for the Synthesis of *endo*-Polynuclear Heterocycles 437

Ahlbrecht, H., Pfaff, K.: 2-(*N*-Methylanilino)-acrylnitril, ein neuer 2-C-Michael-Akzeptor . . . 897

Akhrem, A.A., Lakhvich, F.A., Budai, S.I., Khlebnicova, T.S., Petrusevich, I.I.: A New Simple Synthesis of 2-Acylcyclohexane-1,3-diones 925

Akhrem, A.A., Lakhvich, F.A., Khripach, V.A., Pozdeyev, A.G.: A Convenient One-Step Synthesis of Tetrahydrobenzisoxazoles via 1,3-Cycloaddition of Nitrile Oxides to Cyclohexane-1,3-dione Derivatives 43

Akiba, K., see Ishikawa, K. 608

Alexakis, A., see Cahiez, C. 528

Alper, H., Tanaka, M.: A Simple High-Yield Conversion of Imidoyl Chlorides to Imines and Amines 781

Amit, B., Hassner, A.: The Abnormal Beckmann Rearrangement of a Benzosuberone Oxime (6,6-Dimethyl-5-oximino-6,7,8,9-tetrahydro-5*H*-benzocycloheptene) 932

Anders, E.: Herstellung und Eigenschaften von 1-Acyl-4-benzyliden-1,4-dihydropyridinen . . . 586

Anders, E., Will, W.: 1-Acyl-4-benzyliden-1,4-dihydropyridine; IV. Reaktionen mit Aldehyden und Ketonen zu 1-Phenyl-1-(4-pyridyl)-2-alkanolen 899

Anderson, H.J., see Loader, C.E. 295

Ando, N., Yamamoto, Y., Oda, J., Inouye, Y.: Facile Synthesis of Chiral 18-Crown-6 Derivatives from L-Tartaric Acid 688

Anwer, M.K., Khan, S.A., Sivanandaiah, K.M.: Catalytic Transfer Hydrogenolysis of Protected Peptides using Hydrazine 751

Araújo, H.C., Mahajan, J.R.: Synthesis of Medium- and Macrocyclic Ketothiolactones. Photosensitized Oxygenation of Bicyclic Thioenol Ethers 228

Arias Encarnacion, L., see Adam, W. 828

Asao, T., see Senda, S. 463

Ashdown, D.H.J., see Pelter, A. 843

Baboulene, M., Sturtz, G.: Reactions of Diethyl-1,2-Epoxyalkanephosphonates. A New Synthesis of 2-Oxoalkanephosphonates 456

Baker, D.C., Putt, S.R.: *C*-Acylation of Nitromethane. A Synthetic Route to α-Nitroketones 478

Balasubramanian, K.K., see Perumal Pillai, T. . . . 539

Balderman, D., Kalir, A.: Selective Reduction of Azides. Improved Preparation of α,α-Disubstituted Benzylamines 24

Baldwin, S.W., Crimmins, M.T., Cheek, V.I.: A Convenient Preparation of α-Methylene-δ-valerolactones 210

Bamfield, P., Quan, P.M.: A New Synthesis of Biaryls from Aryl Halides using Aqueous Alkaline Sodium Formate with Palladium on Charcoal and Surfactant as Catalyst 537

Barluenga, J., Nájera, C., Yus, M.: Mercurated Derivatives of Morpholine, Tetrahydro-1,4-thiazine, and Hexahydropyrazine. Synthesis of Substituted Morpholines, Unsaturated Amino-ethers, Aminothioethers, and Diamines 911

Barrett, A.G.M., Barton, D.H.R., Johnson, G., Nagubandi, S.: An Improved Synthesis of 5,6-*trans*-Ergocalciferol 741

Bartlett, P.A., see Hunt, J.T. 741

Bartoli, G., Medici, A., Rosini, G., Tavernari, D.: Reductive *C*-Alkylation of Nitroarenes with Grignard Reagents; Synthesis of Alkyl-amino-arenes 436

Barton, D.H.R., see Barrett, A.G.M. 741

Bastiaansen, L.A.M., Godefroi, E.F.: 2-Aroylimid-azoles; A Simple One-Step Synthesis 675

Beckman, J.C., see Campaigne, E. 385

Bellassoued, M., Frangin, Y.: Synthesis of Substituted Cyclopropanes via Organozinc Reagents 838

Bellassoued, M., Frangin, Y., Gaudemar, M.: A New, Convenient Synthesis of Cyclopentene Derivatives 150

Belli, A., see Giordano, C. 443

Bellotti, V., see Giordano, C. 443

Benders, P.H., van Erkelens, P.A.E.: Chemistry of Alkyldicyanamides; IV. Synthesis of 1-Alkyl-1-cyanothioureas, 3-Alkyl-2-thiobiurets, and 3-Alkyl-2,4-dithiobiurets 775

Benn, M.H., see Meesters, A.C.M. 679

Benoiton, N.L., see Chen, F.M.F. 928

Berbalk, H., Eichinger, K., Fricko, P.: Eine elektrolytische Methode zur Herstellung von 2-Desoxy-D-xylit aus D-Xylose 42

Bigler, P., Mühle, H., Neuenschwander, M.: Chloroacylierung und Bromoacylierung von Carbonyl-Verbindungen: Eine in Vergessenheit geratene Carbonyl-Reaktion 593

Binder, D., Habison, G., Noe, C.R.: (*N*-1)-*t*-Butoxycarbonyl-geschützte 2-Thienylhydrazine; II. Synthese der bisher nicht zugänglichen 2-Thienylpyrazolone 60

Bin Din, L., Lindley, J.M., Meth-Cohn, O.: A Simple Method for Reducing Aromatic Nitro Compounds, Azo Compounds, and Related Systems 23

Bloch, R.: 5,5-Dibromo-2,2-dimethyl-4,6-dioxo-1,3-dioxane; A New Brominating Agent for Saturated and α,β-Unsaturated Carbonyl Compounds 140

Boden, R.M.: A Simple Preparation of 2-Butenolide 143

Bonnaud, B., see Mouzin, G. 304

Bopp, H., see Ried, W. 211

Bostock, S.B., Renfrew, A.H.: An Improved Synthesis of Homogentisic Acid and its Lactone 66

Bottaro, D., see Cristau, H.J. 826

Boyer, J.H., Patel, J.R.: Cyclization from Aryl-formamides in Phosphorus Oxychloride and Tin(IV) Chloride 205

Brandsma, L., see Everhardus, R.H. 359

see Gräfing, R. 578

see Schoufs, M. 439

see Verboom, W. 577

Brandsma, L., Verkruijsse, H.D.: An Improved Synthesis of Cyclooctyne 290

Breitmaier, E., see Skötsch, C. 680

see Waid, K. 748

Brown, H.C., see Hubbard, J.L. 676

Brown, C.A.: Rapid Equilibration of Neat Liquid Alkenes at Low Temperature by Trace Quantities of Potassium 3-Aminopropyl-amide. Preparation of (-)-α-Pinene of High Isomeric and Optical Purity 754

Brown, H.C., Mandal, A.K.: An Improved Synthesis of Monoisopinocampheylborane 146

Brown, S.B., see Katritzky, A.R. 619

Budai, S.I., see Akhrem, A.A. 925

Budhram, R.S., see Uff, B.C. 206

Bühl, H., Gugel, H., Kolshorn, H., Meier, H.: Eine verbesserte Cyclooctyn-Synthese 536

Buhleier, E., Wehner, W., Vögtle, F.: "Cascade-" and "Nonskid-Chain-like" Syntheses of Molecular Cavity Topologies 155

Burger, K., Ottlinger, R.: Reaktionen mit Selenheterocyclen; Δ^4-1,4,2λ^5-Thiazaphospho-line 44

Synthese von Δ^4-1,2,4-Thiaselenazolinen aus 2*H*-1,3-Thiazeten 44

Burger, K., Penninger, S.: Δ^4-1,4,2λ^5-Diazaphos-pholine 526

Herstellung und Reaktionen von *N*-(Hexa-fluoro-2-propyliden)-amidinen (4,4-Bis[tri-fluoromethyl]-1,3-diaza-1,3-butadienen) 524

Cacchi, S., La Torre, F., Paolucci, G.: Oxidation of Allylic Alcohols by 2,3-Dichloro-5,6-dicyano-benzoquinone in a Two-Phase System 848

Cahiez, C., Alexakis, A., Normant, J.F.: A Highly Stereoselective Preparation of 1,4- and 1,5-Alkadienes 528

Calò, V., Lopez, L., Valentino, D.S.: Direct Regiospecific Synthesis of Bromoketones from Epoxides 139

Cambie, R.C., see Woodgate, P.D. 152

Campaigne, E., Beckman, J.C.: A New Synthesis of α-Carboxy-γ-lactones and α-Methylene-γ-lactones 385

Camps, F., Coll, J., Parente, A.: Selenium Dioxide Oxidation of Substrates with Acid-Labile Groups 215

Carlsen, D., see Pedersen, E.B. 844

Cassar, L., Panossian, S., Giordano, C.: Synthesis of Thioamides from Nitriles and Hydrogen Sulphide in the Presence of Phase-Transfer Catalysts 917

Cativiela, C., Meléndez, E.: Geometric Isomers of 2-Phenyl-4-(α-arylethylidene)-5(4*H*)-oxazolones 832

Chabannet, M., see Gelin, S. 448

Chadha, M.S., see Subramaniam, C.S. 468

Chang, V.S., see Lee, D.G. 462

Chattopadhyaya, J.B., Reese, C.B.: Convenient Preparations of 9-β-D-Arabinofuranosylguanine, 9-β-D-Arabinofuranosylhypoxanthine, and Derivatives 908

Chaturvedi, S.C., see Tewari, R.S. 616

Chaw, Y., see Ramirez, F. 519

Cheek, V.I., see Baldwin, S.W. 210

Chen, C.H., Donatelli, B.A., Zumbulyadis, N.: Synthesis and Properties of 2-Chloro-1,3,2-dithiaphosphole 667

Chen, F.M.F., Kuroda, K., Benoiton, N.L.: A Simple Preparation of Symmetrical Anhydrides of *N*-Alkyloxycarbonylamino Acids 928 (erratum: **1979**, 232)

Chioccara, F., Oliva, L., Prota, G., Novellino, E.: A New Synthesis of 4*H*-1,4-Thiazines and Benzothiazines 744

Chiodini, L., Garanti, L., Zecchi, G.: Synthesis of 3-Substituted 1*H*-1,2-Benzodiazepines 603

Chojnowski, J., Cypryk, M., Michalski, J.: The Selective Displacement of *O*-Alkyl by Trialkylsilyl in Some Derivatives of Acids of Phosphorus 777

Chow, F., see Reich, H.J. 299

Christensen, L.W., Heacock, D.J.: A New Reagent for the Conversion of Thiols to Disulfides . . . 50

Christol, H., see Cristau, H.J. 826

Chuit, C., see Masure, D. 458

see Sauvêtre, R. 128

Chun, M.W., see Tamura, Y. 822

Chys, J., see De Kimpe, N. 895

Cohen, V.I.: A Facile Synthesis of 3,5-Diaryl- and 3,5-Diheteroaryl-1,2,4-selenadiazoles 768

Synthesis of Unsubstituted Aromatic and Heterocyclic Selenocarboxamides 668

Coll, J., see Camps, F. 215

Comins, D., Meyers, A.I.: A Facile and Efficient Formylation of Grignard Reagents 403

Comins, D.L., Jacobine, A.F., Marshall, J.L., Turnbull, M.M.: Phosphonate Ester Preparation from Active Methylene Compounds and Phosphorochloridate Esters 309

Commerçon, A., see Samain, D. 388

Conia, J.M., see Huet, F. 63

see Rousseau, G. 67

Connor, D.T., Young, P.A., Strandtmann, M. von: A Coumarin-Chromone Rearrangement. Synthesis of 2-Substituted Chromones via Addition of Carbanions to 4-Methoxycoumarin 208

Cooper, C.F., see Wulfman, D.S. 924

Couffignal, R.: Synthesis of Ethyl and *t*-Butyl 2,4-Dialkyl-5-methylene-4,5-dihydrofuran-3-carboxylates 581

Courtheyn, D., see Verhé, R. 530

Cousse, H., see Mouzin, G. 304

Coutrot, P., see Savignac, P. 682

Coutrot, P., Savignac, P.: A One-Step Synthesis of Diethyl 1,2-Epoxyalkanephosphonates . . . 34

Coutrot, P., Savignac, P., Mathey, F.: α-Cuprophosphonates; III. Synthesis of Ethyl Dialkylphosphonopyruvates 36

Coutrot, P., Snoussi, M., Savignac, P.: An Improvement in the Wittig-Horner Synthesis of 2-Alkenoic Acids 133

Crimmins, M.T., see Baldwin, S.W. 210

Cristau, H.J., Christol, H., Bottaro, D.: Neue Wittig-Reagenzien für die Formylolefinierung von Aldehyden. Herstellung von 2-Alkenyl-1,3-dithianen 826

Cupas, C.A., see Olah, G.A. 452

Cuvigny, T., Larchevêque, M., Normant, H.: A Convenient Synthesis of Monoacetals of α-Diketones 857

Cuvigny, T., Larchevêque, M., Normant, H., Naulet, N.: Reactions of Lithiated Pyruvaldehyde Acetals with Oxiranes; Part II 390

Cypryk, M., see Chojnowski, J. 777

Daniil, D., Merkle, U., Meier, H.: α-Diazocarbonyl-Verbindungen aus Semicarbazonen . . . 535

De Buyck, L., see De Kimpe, N. 895

see Verhé, R. 530

De Clercq, P., see Rozing, G.P. 225

Degani, I., Fochi, R.: The Phase-Transfer Synthesis of *O,S*-Dialkyl Dithiocarbonates from Alkyl Halides and Alkyl Methanesulfonates . . . 365

De Groot, A., Jansen, B.J.M.: Diels-Alder Reaction of Exocyclic Sulfur-Substituted 1,3-Dienes 52

De Kimpe, N., see Verhé, R. 530

De Kimpe, N., Verhé, R., De Buyck, L., Chys, J., Schamp, N.: Synthesis of α-Iminonitriles (Imidoyl Cyanides) 895

De Micheli, C., see Gandolfi, R. 383

Descoins, C., see Samain, D., ... 388

Descotes, G., see Faure, A. 286

Deshayes, C., see Gelin, S. 900

Dhar, D.N., see Mehta, G. 374

Di Bello, N., Pellacani, L., Tardella, P.A.: Synthesis of γ-Chloro (β-Chloromethyl) Ketones from α-Cyclopropyl Ketones 227

Donatelli, B.A., see Chen, C.H. 667

Drabowicz, J., Mikołajczyk, M.: A Facile and Selective Oxidation of Organic Sulphides to Sulphoxides with the Hydrogen Peroxide/Selenium Dioxide System 758

An Iodine-Catalysed Reduction of Sulphoxides by Formamidinesulphinic Acid 542

A Rapid and Mild Reduction of Sulphoxides with Titanium(II) Chloride 138

Dreher, E.L., see Rieker, A. 851

Dürr, H., Hackenberger, A.: A New Synthesis of 1*H*-Cyclopenta[*l*]phenanthrenes and 1,2-Diphenyl-9b*H*-cyclopenta[*jk*]fluorene by Photolysis of Phenyl-substituted 3*H*-Indazole(3-spiro)cyclopentadienes 594

Durst, T., see Finlay, J.D. 579

Ebata, T., see Kano, S. 746

Eckes, L., Hanack, M.: Herstellung von Vinylfluoriden 217

Effenberger, F., see Häbich, D. 755

see Huthmacher, K. 693

Eichinger, K., see Berbalk, H. 42

Eisele, G., Simchen, G.: Synthese und Eigenschaften sterisch gehinderter, tertiärer aliphatischer Amine 757

Emery, S.E., see Gribble, G.W. 763

Engel, N., see Möller, R. 620

Everhardus, R.H., Brandsma, L.: A Simple, One-Pot Synthesis of 1-Alkylthio- or 1-Arylthio-3-buten-1-ynes 359

Faure, A., Descotes, G.: Synthesis of *O,S*-Dimethyl Trithioorthocarbonates by Thermolysis of *O,O'*-Alkanediyl *S,S'*-Dimethyl Bisdithiocarbonates 286

Ferraz, H.M.C., see Petragnani, N. 476

Fick, H.H., see Adam, W. 828

Findeisen, K., Wagner, K.: Reaktionen von Dichloro- und Trichloro-Verbindungen mit aktivierten Nitrilen; I. Synthese von *N*-Polychloroalkylimid-chloriden 38

Reaktionen von Dichloro- und Trichloro-Verbindungen mit aktivierten Nitrilen; II. Synthese von *N*- und *O,N*-Heterocyclen . . . 40

Finlay, J.D., Smith, D.J.H., Durst, T.: The Photolysis of 2-Phenylthietan-1,1-dioxides; Preparation of Substituted Cyclopropanes 579

Fochi, R., see Degani, I. 365

Foucaud, A., see Marchand, E. 360

Frangin, Y., see Bellassoued, M. 150, 838

Fricko, P., see Berbalk, H. 42

Fuchita, T., see Suzuki, H. 905

Fujita, Y., Onishi, T., Nishida, T.: A Facile Synthesis of 3,7-Unsaturated Esters via Two Consecutive Claisen-Cope Rearrangements . . . 532

A New Efficient Synthesis of Polyprenyl Ketones via Oxy-Cope Rearrangement 934

A Novel Method for Introduction of the Isoprene Skeleton into Chloromethylarenes and -heteroarenes via a Three-Step Sequence involving a Solvent-Assisted Claisen-Cope Rearrangement 612

Fukunaga, K.: A New Synthesis of 3,4,5-Triaryl-4,5-dihydro-1,2-oxazole *N*-Oxides 55

Funaki, K., see Kano, S. 746

Furukawa, M., Okawara, T., Noguchi, Y., Nishikawa, M.: Convenient Syntheses of Sulfinic Ester Derivatives 441

Furuta, T., see Maki, Y. 382

Galakatos, N.G., Hancock, J.E.H., Morgan, O.M., Roberts, M.R., Wallace, J.K.: On the Use of Ceric Salts as Coupling Agents; Part 1 472

Gandolfi, R., De Micheli, C.: Reactions of 6-Substituted 12,13-Dimethoxycarbonyl-4,5-diazatetracyclo[7.2.2.0^{2,8}.0^{3,7}]trideca-4,10-dienes with Tetracyanooxirane; Synthesis of Stable Azomethine Imines 383

Garanti, L., see Chiodini, L. 603

Gaudemar, M., see Bellassoued, M. 150

Gauss, W., Kabbe, H.J.: *N*-Substituierte 2-Amino-4*H*-3,1-benzoxazine aus 2-Chloromethylphenyl-isocyanaten 377

Geevers, J., see Reinhoudt, D.N. 368

Geisel, H., see Rieker, A. 851

Gelin, S., see Pollet, P. 142

Gelin, S.: Synthesis of 1,2,5-Trisubstituted 3-Ethoxycarbonyl-5-hydroxy-4-oxo-4,5-dihydropyrroles 291

Gelin, S., Chabannet, M.: Synthesis of some 3(or 5)-Substituted 4-Ethoxycarbonyl-5(or 3)-(1-hydroxyalkyl)-pyrazoles 448

Gelin, S., Deshayes, C.: Synthesis of Some 3(or 5)-Substituted 5(or 3)-(2-Hydroxyalkyl)-pyrazoles from 2,3-Dihydro-4-pyrones 900

Georgoulis, C., Valery, J.M.: A Convenient Procedure for the Preparation of Vicinal Alkoxyiodoalkanes from Alkenes by Means of Copper(II) Acetate and Iodine 402

Ghosh, C.K., Mukhopadhyay, K.K.: Reactions of 4-Oxo-4*H*-1-benzopyran-3-carboxylic Acids with Phenylhydrazine, Guanidine, and Hydroxylamine 779

Giguere, R.J., Rawson, D.I., Hoffmann, H.M.R.: 9,10-Dihydro-9,10-propanoanthracenes 902

Giordano, C., see Cassar, L. 917

Giordano, C., Belli, A., Bellotti, V.: 4*H*-1,3,5-Dithiazines from α-Thioamidoalkylating Agents, Aldehydes, and Hydrogen Sulphide . . . 443
(erratum: 1979, 152)

Godefroi, E.F., see Bastiaansen, L.A.M. 675

Goerdeler, J., Richter, R.: Imidoyl-isocyanate und ihre Folgeprodukte 760

Goliński, J., Mąkosza, M.: Reactions of Organic Anions; Part LXXXIV. A Convenient Method for Synthesis of 1-Chloro-, 1,1-Dichloro-, and 1,2-Epoxyalkanesulfonamides 823

Goossens, H.J.M., see Scheeren, J.W. 283

Gopalan, B., see Perumal Pillai, T. 539

Gore, P.H., Kamonah, F.S.: Photochemical Synthesis of Some Mono-Substituted Chrysenes 773

Górecka, A., Leplawy, M., Zabrocki, J., Zwierzak, A.: Diethyl Phosphorobromidate – An Effective New Peptide-Forming Agent . . . 474

Gračner, M., see Stanovnik, B. 65

Gräfing, R., Brandsma, L.: Synthesis of the New Heterocyclic Compounds 2*H*,7*H*-Thiopyrano[2,3-*b*]thiopyran and 2*H*,7*H*-Dithiopyrano[2,3-*b*:3′,2′-*d*]thiophene 578

Granata, A., see Harpp, D.N. 782

Greer, S., see Midland, M.M. 845

Gribble, G.W., Jasinski, J.M., Pellicone, J.T., Panetta, J.A.: Reactions of Sodium Borohydride in Acidic Media; VIII. *N*-Alkylation of Aliphatic Secondary Amines with Carboxylic Acids 766

Gribble, G.W., Kelly, W.J., Emery, S.E.: Reactions of Sodium Borohydride in Acidic Media; VII. Reduction of Diaryl Ketones in Trifluoroacetic Acid 763

Günther, H., see Voss, J. 849

Gugel, H., see Bühl, H. 536

Gupta, B.G.B., see Olah, G.A. 137

Guy, A., see Hedayatullah, M. 357

Habison, G., see Binder, D. 60

Hackenberger, A., see Dürr, H. 594

Häbich, D., Effenberger, F.: Herstellung von Trimethylsilyl-estern durch Protodesilylierung von Aryltrimethylsilanen 755

Hanack, M., see Eckes, L. 217

Hanack, M., Kunzmann, E., Schumacher, W.: Eine einfache Herstellungsmethode für *trans*-2-Ethynylcycloalkanole 26

Hancock, J.E.H., see Galakatos, N.G. 472

Hankovszky, H.O., see Hideg, K. 313, 914

Hardy, P.M.: A Convenient One-Step Synthesis of Pyroglutamic Acid (2-Oxotetrahydropyrrole-5-carboxylic Acid) 290

Harpp, D.N., Granata, A.: Transfer Reagents in Organosulfur Chemistry. The Preparation of Sulfinyl and Sulfonyl Thiocarbonates 782

Hassner, A., see Amit, B. 932

Hauptmann, H., Mader, M.: Herstellung von 2-Alkynalen und 1-Alkynyl-ketonen aus Lithium-acetyleniden und Carbonsäure-estern 307

Hayashi, T., see Sakurai, A. 370

Heacock, D.J., see Christensen, L.W. 50

Heber, D.: 5*H*-[1]Benzopyrano[4,3-*b*]pyridine durch Kondensation von 3-Acylchromonen mit Enaminen 691

Hedayatullah, M., Guy, A.: A Convenient Synthesis of Aryl Sulfamates 357

Heilmann, S.M., see Rasmussen, J.K. 219

Heitzer, H., see Kabbe, H.J. 888

Heuschmann, M., see Quast, H. 547

Hibino, S., see Kano, S. 305

Hideg, K., Hankovszky, H.O.: Benzazoles; XI. Synthesis of New Fused Benzimidazoles by 1,3-Dipolar Cycloaddition Reactions 313

Hideg, K., Lex, L., Hankovszky, H.O., Tigyi, J.: Nitroxyls; III. Synthesis of Spin-Labelled Amino Acids and Their Reactive Derivatives 914

Hirashima, T., see Miyata, T. 834

Hirota, K., see Senda, S. 463

Ho, T.-L.: Cerium(IV) Oxidation with a Dual Oxidant System; Reaction of Some Arylmethanols 936

Hoffmann, H.M.R., see Giguere, R.J. 902

Hojo, M., Masuda, R., Takagi, S.: Stereospecific Synthesis of Vinyl-*d*-Sulfides 284

Hollitzer, O., see Steglich, W. 622

Horak, V., see Manning, W.B. 363

Hordziejewicz, F., Skrowaczewska, Z.: Application of a (2,4-Dinitrophenyl)-phenanthrolinium Salt to the Synthesis of 1,8-Phenanthroline 1-Oxide and 8-Oxide 585

Hori, I., see Sakurai, A. 370

Horiike, T., see Ryu, I. 154

Hosogai, T., see Ichinose, I. 605

Huang, S.L., Omura, K., Swern, D.: Further Studies on the Oxidation of Alcohols to Carbonyl Compounds by Dimethyl Sulfoxide/Trifluoroacetic Anhydride 297

Hubbard, J.L., Brown, H.C.: Hydride-Induced Carbonylation of Trialkylboranes Followed by Treatment with Acid and Oxidation. A New Synthesis of Dialkylcarbinols under Mild Conditions 676

Huet, F., Lechevallier, A., Pellet, M., Conia, J.M.: Wet Silica Gel; A Convenient Reagent for Deacetalization . . . . . 63 (erratum: 624)

Hunt, J.T., Bartlett, P.A.: Regioselective Synthesis of 5-Amino-4-imidazolecarboxylates via Isonitrile Cycloaddition 741

Huthmacher, K., Effenberger, F.: Neue reaktive Bromierungsagentien 693

Ichinose, I., Hosogai, T., Kato, T.: Selective Oxidation of Polyenes with 2,4,4,6-Tetrabromocyclohexadienone (TBCO) 605

Iida, H., see Takahashi, K. 892

Ikeda, I., Machii, Y., Okahara, M.: A New Method of Converting Aldehydes to Nitriles 301

Inamoto, N., see Ishikawa, K. 608

Inoue, K., see Tamura, Y. 822

Inoue, S., see Suzuki, E. 144

Inouye, Y., see Ando, N. 688

Ipach, I., see Severin, T. 592

Iriuchijima, S.: A Convenient Synthesis of (*R*)- and (*S*)-2-Anilinomethylpyrrolidines 684

Irwin, D.C., see Smith, J.G. 894

Ishikawa, K., Akiba, K., Inamoto, N.: Wittig-Horner Reaction of Phosphonates Derived from Heteroniaanthracene Cations 608

Ishino, Y., see Miyata, T. 834

Itahara, T., Sakakibara, T.: Intramolecular Ring Closure of 3-Benzoylindoles by Palladium Acetate 607

Iwasa, A., see Suzuki, H. 905

Jacobine, A.F., see Comins, D.L. 309

Jain, S.K., see Agarwal, N.L. 437

Jansen, B.J.M., see De Groot, A. 52

Jasinski, J.M., see Gribble, G.W. 766

Jindo, Y., see Sakurai, A. 370

Jiricny, J., Orere, D.M., Reese, C.B.: Hydrogen Peroxide/Potassium Carbonate Promoted Regeneration of Aldehydes and Ketones from their Arenesulphonyl Hydrazones 919

Johnson, G., see Barrett, A.G.M. 741

Johnson, M.R., Sousa, L.R.: A Synthesis of 3-Mono- and 3,3-Disubstituted 2-Oxo-1,5,6,6-tetramethyl-1,2,3,6-tetrahydropyrazines 317

Jończyk, A., Ochal, Z., Mąkosza, M.: Reactions of Organic Anions; LXXXV. Catalytic Two-Phase Alkylation of Cyanamide 882

Jończyk, A., Pytlewski, T.: Reactions of Organic Anions; LXXXVIII. Catalytic Two-Phase Alkylation of Iodomethyl Aryl Sulfones 883

Jung, M.E., Mazurek, M.A., Lim, R.M.: A New Efficient Synthesis of Iodomethyl Methyl Ether 588

Kabbe, H.J.: Eine einfache Synthese von 4-Chromanonen 886

Kabbe, H.J., see Gauss, W. 377

Kabbe, H.J., Heitzer, H.: Eine neue Synthese vo von 3,4-Dehydro-α-tocotrienol und Vitamin E 888

Kadaba, P.K.: Triazolines; XI. Oxidation of 1*H*-4,5-Dihydro-1,2,3-triazoles Using Phase-Transfer Catalysis. A Useful Synthetic Route to 5-Heterocyclic-Substituted 1,2,3-Triazoles 694

Kafarski, P., see Zygmunt, J. 609

Kaiser, E.M., Knutson, P.L.: Preparation and Condensations of 6,7-Dimethoxy-1-lithiomethyl-isoquinoline 148

Kaji, A., see Sugihara, H. 881

Kalir, A., see Balderman, D. 24

Kalyanasundaram, S.K., see Ramasamy, K. 311, 545

Kamath, H.V., Kulkarni, S.N.: *o*-Aminophenyl Alkyl and Aralkyl Ketones and Their Derivatives; Part II. A New Synthesis of Substituted 2-Arylisatogens 931

Kamonah, F.S., see Gore, P.H. 773

Kano, S., Ebata, T., Funaki, K., Shibuya, S.: A New and Facile Synthesis of 3-Alkylideneazetidin-2-ones by Reactions of 3-Trimethylsilylazetidin-2-one with Carbonyl Compounds 746

Kano, S., Takahagi, Y., Shibuya, S.: Synthesis of Pyrazine and Quinoxaline Derivatives through Condensation of 1,2-Diamino Compounds with β-Ketosulfoxides under Neutral Conditions 372

Kano, S., Yokomatsu, T., Ono, T., Hibino, S., Shibuya, S.: A New Synthesis of Phenylalkynes from the *p*-Toluenesulfonylhydrazone of α-Methylthioacetophenone 305

Karl, H., see Thiem, J. 696

Kaspi, J., see Olah, G.A. 396

Kato, T., see Ichinose, I. 605

Katritzky, A.R., Brown, S.B.: A Mild, High-Yield Procedure for the Conversion of Benzyl Halides to Benzaldehydes 619

Katsube, J., see Morooka, S. 445

Katsuragawa, B., see Suzuki, E. 144

Kawashima, K., see Nakatani, Y. 147

Kelly, W.J., see Gribble, G.W. 763

Keumi, T., see Olah, G.A. 929

Khalifa, M.H., see Rieker, A. 851

Khan, S.A., see Anwer, M.K. 751

Khan, S.A., Sivanandaiah, K.M.: Catalytic Transfer Hydrogenation in Solid-Phase Peptide Synthesis: Synthesis of Bradykinin 750

Khlebnicova, T.S., see Akhrem, A.A. 925

Khripach, V.A., see Akhrem, A.A. 43

Kikugawa, Y., Saito, K., Yamada, S.: Reduction of Heterocycles with Pyridine:Borane in Acetic Acid 447

Kim, K.S., Szarek, W.A.: Methylenation of Carbohydrates Using Phase-Transfer Catalysis 48

Kimura, S., see Takahashi, K. 892

Klauke, E., Oehlmann, L.: Herstellung von 2-(Mono-, Di- und Trichloromethyl)-phenylisocyanaten 376

Kleijn, H., see Westmijze, H. 454

Kluba, M., Zwierzak, A.: Alkylation of Tetra-*n*-butylaminium Alkyl Hydrogen Phosphites. A New Route to Mixed Dialkyl Phosphites . . . 134

Kluba, M., Zwierzak, A.: Tetra-*n*-butylaminium Di-*t*-butyl Phosphate. A New Effective Phosphorylating Agent for Alkyl Bromides 770

Knutson, P.L., see Kaiser, E.M. 148

Kobayashi, T., see Ogura, H. 394

Kolshorn, H., see Bühl, H. 536

Kondratenko, N.V., see Yagupolskii, L.M. 835

Konieczny, M., see Sosnovsky, G. 583

Konno, S., Stammer, C.H.: A New Dehydropeptide Synthesis. Direct Oxidation of a Dipeptide Azlactone 598

Krogh, J.A., see Sosnovsky, G. 703

Krzyzanowska, B., Stec, W.J.: A New Approach to the Synthesis of Primary Amines, Isothiocyanates, and 1-Aminoalkanephosphonates via *N*-Phosphinyl Aldoximes and Ketoximes 521

Kudzin, Z.H., Stec, W.J.: Synthesis of 1-Aminoalkanephosphonates via Thioureidoalkanephosphonates 469

Kulkarni, S.N., see Kamath, H.V. 931

Kunzmann, E., see Hanack, M. 26

Kuroda, K., see Chen, F.M.F. 928

Lakhvich, F.A., see Akhrem, A.A. 43, 925

Landini, D., Montanari, F., Rolla, R.: Cleavage of Dialkyl and Aryl Alkyl Ethers with Hydrobromic Acid in the Presence of Phase-Transfer Catalysts 771

Phase-Transfer Catalysts: Synthesis and Catalytic Activity of a Tricyclohexyl-[2.2.2]cryptand (Perhydro-tribenzo-hexaoxadiaza[8.8.8]eicosane) 223

Larchevêque, M., see Cuvigny, T. 390, 857

La Torre, F., see Cacchi, S. 848

Lechevallier, A., see Huet, F. 63

Lee, D.G., Chang, V.S.: The Preparation of *alpha*-Diones. Phase-Transfer Assisted Oxidation of Alkynes by Potassium Permanganate 462

Lee, H.H., see Woodgate, P.D. 152

Leiblein, F., see Unterhalt, B. 700

Leplawy, M., see Górecka, A. 474

Lerche, H., Severin, T.: Synthese von 2-Alkoxy-1-aminopyrrolen; Umsetzungen mit Monohydrazonen von Dicarbonyl-Verbindungen ... 687

Lesher, G.Y., see Singh, B. 829

Lex, L., see Hideg, K. 914

Liebl, R., see Märkl, G. 846

Lim, R.M., see Jung, M.E. 588

Lindley, J.M., see Bin Din, L. 23

Linke, S.: *N*-Alkylcarboxamide aus Nitrilen unter basischen Bedingungen 303

Liu, K.T., Tong, Y.C.: A Facile Conversion of Thiols to Disulfides 669

Loader, C.E., Anderson, H.J.: Pyrrole Chemistry Part XX: Synthesis of Pyrrole Acetals 295

Lombardo, L., Taylor, R.J.K.: Silicon in Organic Synthesis; An Improved Preparation of α,β-Unsaturated Acids from Carbonyl Compounds 131

Lopez, L., see Calò, V. 139

Lyle, G.G., see Maloney, J.R. 212

Lyle, R.E., see Maloney, J.R. 212

McCaffrey, T., see Ramirez, F. 519

McCall, J.M., TenBrink, R.E.: 3-Amino-3-cyaniminopropanenitriles; Useful Precursors for 2-Chloro-4,6-diamino- and 2,4,6-Triaminopyrimidine *N*-Oxides 673

Macchii, Y., see Ikeda, I. 301

Mader, M., see Hauptmann, H. 307

Märkl, G., Liebl, R.: Kupplung von P^V-Phosphorinen mit Arendiazoniumsalzen. Herstellung einer neuen Klasse von Azo-Farbstoffen 846

Mahajan, J.R., see Araújo, H.C. 228

Maki, Y., Furuta, T.: Photolysis of *N*-Aryl-2-nitrobenzhydrazonoyl Bromides; A Photochemical Formation of 3-Aryl-4-oxo-3,4-dihydro-1,2,3-benzotriazines 382

Mąkosza, M., see Goliński, J. 823

see Jończyk, A. 882

Maletina, I.I., see Yagupolskii, L.M. 835

Malhotra, R., see Olah, G.A. 672

Maloney, J.R., Lyle, R.E., Saavedra, J.E., Lyle, G.G.: Oxidative Deoximation with Pyridinium Chlorochromate 212

Mamdapur, V.R., see Subramaniam, C.S. 468

Mandal, A.K., see Brown, H.C. 146

Mangia, A.: A Mild and Convenient Synthesis of Penicillin and Cephalosporin Sulfoxides ... 361

Manhart, E., Werner, K.v.: Perfluoroalkyl-Induced Dimerization of Allylic Azides 705

Manning, W.B., Horak, V.: Synthesis of 6-Aminobenzothiazoles from *p*-Benzoquinone Imine Derivatives 363

Manzocchi, A., see Santaniello, E. 534, 891

Marchand, E., Morel, G., Foucaud, A.: A Convenient Method for the Sulfenylation of Nitriles 360

Marecek, J.F., see Ramirez, F. 519, 601

Marianelli, R.S., see Whiteley, R.V. 392

Marshall, J.L., see Comins, D.L. 309

Mastalerz, P., see Oleksyszyn, J. 479

see Zygmunt, J. 609

Masuda, R., see Hojo, M. 284

Masure, D., see Sauvêtre, R. 128

Masure, D., Chuit, C., Sauvêtre, R., Normant, J.F.: Addition of Organometallic Compounds to 2-Chloro-1,1-difluoro-3-hydroxy-1-alkenes. A New Synthesis of α,β-Unsaturated α-Chloro Aldehydes and Ketones 458

Mathey, F., see Coutrot, P. 36

Matsuda, I., see Murata, S. 221

Matsumoto, K., see Suzuki, M. 461

Matsumoto, K., Uchida, T.: Cycloaddition Reactions of Dicyanomethylids with Triphenylcycloprene. A Simple Route to 1,2,3-Triphenylindolizines 207

Matsuura, A., see Morooka, S. 445

Matthies, D.: Herstellung und Umsetzung von *N*-Acyl-α-chloroglycinen 53

Mazurek, M.A., see Jung, M.E. 588

Medici, A., see Bartoli, G. 436

Meesters, A.C.M., Benn, M.H.: The Direct Synthesis of *N*-*t*-Alkyl-*O*-*t*-butylhydroxylamines from *t*-Butyl Peroxybenzoate and the Lithium Salts of Primary *t*-Alkylamines . . . 679

Mehta, G., Dhar, D.N., Suri, S.C.: Reaction of Indoles with Chlorosulphonyl Isocyanate; A Versatile Route to 3-Substituted Indoles . . . 374

Meidar, D., see Olah, G.A. 358, 396, 671, 929

Meier, H., see Bühl, H. 536

see Daniil, D. 353

Meier, H., Petersen, H.: Synthese von 5-substituierten Cyclooctynen 596

Meijer, J., see Schoufs, M. 439

see Verboom, W. 577

Meléndez, E., see Cativiela, C. 832

Merkle, U., see Daniil, D. 535

Merour, J.Y., Tatibouët, F.: A New Synthesis of 2,3,4-Substituted Quinolines 698

Meth-Cohn, O., see Bin Din, L. 23

Meth-Cohn, O., Tarnowski, B.: A Useful Synthon for Sulphur Heterocycles; I. The Synthesis of Thiocoumarins 56

A Useful Synthon for Sulphur Heterocycles, II. The Synthesis of Fused Thiopyrones, Benzisothiazoles, and Benzothiophenes 58

Metzger, J., see Vernin, G. 921

Meyers, A.I., see Comins, D. 403

Michalski, J., see Chojnowski, J. 777

Midland, M.M., Greer, S.: The Preparation of 9-Borabicyclo[3.3.1]nonane-9-*d* 845

Mikołajczyk, M., see Drabowicz, J. . . . 138, 542, 758

Minamikawa, J., see Tamura, Y. 822

Mishina, T., see Suzuki, H. 905

Mitchell, V., see Pearson, D.E. 127

Miyano, S., Abe, N., Takeda, K., Sumoto, K.: Synthesis of 1-Methyl-3,4-dihydropyrido-[1,2-*a*]benzimidazoles 451

Miyano, S., Somehara, T., Nakao, M., Sumoto, K.: A Novel Synthesis of $\Delta^{4(8)}$-Dehydropyrrolizidinium Perchlorate 701

Miyata, T., Ishino, Y., Hirashima, T.: Catalytic Reduction of Aromatic Nitro Compounds with Hydrazine Hydrate in the Presence of Iron(III) Oxide Hydroxide 834

Miyoshi, M., see Suzuki, M. 461

Mizuno, K., see Pac, C. 589

Möller, R., Engel, N., Steglich, W.: Herstellung von (*E*)-3-Alkoxy- und (*E*)-3-Alkylthio-2-butenolen und der entsprechenden Aldehyde 620

Moller, F., see Neidlein, R. 685

Mollov, N.M., Venkov, A.P.: Eine neue Methode zur Synthese von 2-Acyl-1-aryl-1,2,3,4-tetrahydroisochinolinen 62

Montanari, F., see Landini, D. 223, 771

Morel, G., see Marchand, E. 360

Morgan, O.M., see Galakatos, N.G. 472

Morooka, S., Tamoto, K., Matsuura, A., Katsube, J.: A Convenient Synthesis of 2-Cyano-3-phenylindoles 445

Mouzin, G., Cousse, H., Bonnaud, B.: A Convenient Synthesis of Bifunctional Vicinal Cyclopropanes 304

Mühle, H., see Bigler, P. 593

Mukhopadhyay, K.K., see Ghosh, C.K. 779

Murai, S., see Ryu, I. 154

Murata, S., Matsuda, I.: A Novel Route to 1,4-Diketones and its Application to *cis*-Jasmone and Dihydrojasmone Synthesis 221

Murugesan, M., see Ramasamy, K. 842

Nagubandi, S., see Barrett, A.G.M. 741

Nájera, C., see Barluenga, J. 911

Nakao, M., see Miyano, S. 701

Nakatani, Y., Kawashima, K.: A Highly Stereoselective Preparation of *l*-Isopulegol 147

Narang, S.C., see Olah, G.A. 137, 452, 672, 690, 825

Naulet, N., see Cuvigny, T. 390

Neidlein, R., Moller, F.: Synthese von 3-Oxo-1,3-dihydrobenzo[*cd*]indolen (Azapseudophenalenonen) und Benzo[*cd*]indoliumsalzen (Azapseudophenalenium-salzen) 685

Neuenschwander, M., see Bigler, P. 593

Nishida, T., see Fujita, Y. 532, 612, 934

Nishikawa, M., see Furukawa, M. 441

Noe, C.R., see Binder, D. 60

Noguchi, Y., see Furukawa, M. 441

Normant, H., see Cuvigny, T. 390, 857

Normant, J.F., see Cahiez, C. 528

see Masure, D. 458

see Perriot, P. 33

see Sauvêtre, R. 128

see Villieras, J. 27, 29, 31

Novellino, E., see Chioccara, F. 744

Nunami, K., see Suzuki, M. 461

Nunami, K., Suzuki, M., Yoneda, N.: Synthesis of α-Alkylated α-(1-Cycloalkenyl)-glycines 840

Ochal, Z., see Jończyk, A. 882

Oda, J., see Ando, N. 688

Oehlmann, L., see Klauke, E. 376

Ogawa, Y., see Takahashi, K. 892

Ogura, H., Takeda, K., Tokue, R., Kobayashi, T.: A Convenient Direct Synthesis of Ureas from Carbon Dioxide and Amines 394

Oishi, T., see Sakurai, A. 370

Okahara, M., see Ikeda, I. 301

Okamoto, H., see Pac, C. 589

Okawara, T., see Furukawa, M. 441

Olah, G.A., Gupta, B.G.B., Narang, S.C.: Synthetic Methods and Reactions; 45. Deoxygenation of Sulfoxides with Triphenylphosphine/Iodine/Sodium Iodide Reagent 137

Olah, G.A., Kaspi, J., Meidar, D.: Synthetic Methods and Reactions; 44. A Convenient Preparation of *p*-Isopropylphenol and other 4-Alkylphenols by the Aluminium Chloride-Catalyzed Cleavage of Bisphenol-A and its Analogs in Methylcyclopentane/Benzene Solution 396

Olah, G.A., Keumi, T., Meidar, D.: Synthetic Methods and Reactions; 51. A Convenient and Improved Method for Esterification over Nafion-H, a Superacidic Perfluorinated Resinsulfonic Acid Catalyst 929

Olah, G.A., Malhotra, R., Narang, S.C., Olah, J.A.: Heterogenous Catalysis by Solid Superacids; 11. Perfluorinated Resinsulfonic Acid (Nafion-H) Catalyzed Friedel-Crafts Acylation of Benzene and Substituted Benzenes 672

Olah, G.A., Meidar, D.: Heterogeneous Catalysis by Solid Superacids; 9. Convenient New Procedure for Pinacolone Rearrangements . . . 358

Olah, G.A., Meidar, D.: Heterogeneous Catalysis by Solid Superacids; 10. Mercury Impregnated Nafion-H Perfluorinated Resinsulfonic Acid Catalyzed Hydration of Alkynes 671

Olah, G.A., Narang, S.C.: Synthetic Methods and Reaction; 49. Perfluorinated Resinsulfonic Acid (Nafion-H) Catalyzed Nitration of Aromatic Compounds with Butyl Nitrate 690

Olah, G.A., Narang, S.C., Pearson, R.L., Cupas, C.A.: Synthetic Methods and Reactions; 48. Convenient and Safe Preparation of Alkyl Nitrates (Polynitrates) via Transfer Nitration of Alcohols (Polyols) with *N*-Nitrocollidinium Tetrafluoroborate 452

Olah, G.A., Surya Prakash, G.K.: Synthetic Methods and Reactions; 47. $AlCl_3$/Pd-Catalyzed Reduction of Aryl Substituted Alcohols and Olefins by Hydrogen Transfer from Cyclohexene 397

Olah, G.A., Surya Prakash, G.K., Narang, S.C.: Synthetic Methods and Reactions; 53. Convenient Reductive Cleavage of Benzylic (Benzhydrilic) Ethers and Acetals Using $AlCl_3$/Pd-Catalyzed Hydrogen Transfer from Cyclohexene 825

Olah, G.A., Vankar, Y.D.: Synthetic Methods and Reactions; 52. Preparation of Nitriles from Aldoximes via Dehydration with Trimethylamine/Sulfur Dioxide Complex 702

Olah, J.A., see Olah, G.A. 672

Oleksyszyn, J., Tyka, R., Mastalerz, P.: Direct Synthesis of 1-Aminoalkanephosphonic and 1-Aminoalkanephosphinic Acids from Phosphorus Trichloride or Dichlorophosphines 479

Oliva, L., see Chioccara, F. 744

Omura, K., see Huang, S.L. 297

Onishi, T., see Fujita, Y. 532, 612, 934

Ono, T., see Kano, S. 305

Orda, V.V., see Yagupolskii, L.M. 835

Orere, D.M., see Jiricny, J. 919

Ottlinger, R., see Burger, K. 44

Otto, H.H., Rinus, O., Schmelz, H.: Heterocycles via the Michael Reaction; III. A Convenient Method for the Preparation of 6-Alkoxy-2-pyridone Derivates 681

Pac, C., Mizuno, K., Okamoto, H., Sakurai, H.: A Michael-Type Alkylation of the Naphthalene Ring Utilizing Regiospecific Photocycloaddition 589

Panetta, J.A., see Gribble, G.W. 766

Panossian, S., see Cassar, L. 917

Paolucci, G., see Cacchi, S. 848

Paramasivam, K., see Veeramani, K. 855

Paramasivam, K., Veeramani, K., Ramasamy, K., Shanmugam, P.: A New Convenient Synthesis of the Indeno[2,1-*c*]quinoline System from 4-Phenyl-3-vinylquinoline Derivatives 889

Paraskewas, S.M.: Aminomethylierung des Bis-[pyridin-3-carboxamid]-$PdCl_2$-Komplexes 47

Parente, A., see Camps, F. 215

Patel, J.R., see Boyer, J.H. 205

Peake, S.L., see Reich, H.J. 299

Pearson, D.E., Mitchell, V., Sullivan, T.J., Tarock Watson, J.: The Synthesis of Pentafluorobenzoic Acid and a New Purification of Chloropentafluorobenzene 127

Pearson, R.L., see Olah, G.A. 452

Pedersen, E.B., Carlsen, D.: Phosphoramides; VIII. Phosphorus Pentoxide/Amine Mixtures as Reagents in a Facile Synthesis of Dialkylaminopyridines 844

Pellacani, L., see Di Bello, N. 227

Pellegata, R., Pinza, M., Pifferi, G.: An Improved Synthesis of γ-, δ-, and ϵ-Lactams 614

Pellet, M., see Huet, F. 63

Pellicone, J.T., see Gribble, G.W. 766

Pelter, A., Ward, R.S., Ashdown, D.H.J.: The Synthesis of Mono-, Di-, and Trihydroxyisoflavones 843

Penninger, S., see Burger, K. 524, 526

Perchec, P. Le, see Rousseau, G. 67

Perriot, P., see Villieras, J. 29, 31

Perriot, P., Villieras, J., Normant, J.F.: Diethyl 1-Chloro-1-lithioalkanephosphonates. A General Synthesis of Diethyl 1,2-Epoxyalkanephosphonates and 1-Alkoxycarbonyl-1-chloroalkanephosphonates 33

Perumal Pillai, T., Rajagopalan, K., Gopalan, B., Swaminathan, S., Balasubramanian, K.K.: Synthesis and Rearrangement of α-Aryl-aminomethylacrylic Esters 539

Petersen, H., see Meier, H. 596

Petragnani, N., Ferraz, H.M.C.: 2-Phenylseleno-propanoic Acid: A Useful Synthon for α-Methylene-γ-lactones 476

Petrusevich, I.I., see Akhrem, A.A. 925

Pfaff, K., see Ahlbrecht, H. 897

Pifferi, G., see Pellegata, R. 614

Pinza, M., see Pellegata, R. 614

Pochini, A., Ungaro, R.: Cationic Control on Competing Reactions: Selective Synthesis of 1,1-Bis[2-hydroxyaryl]alkanes 617

Polanc, S., see Stanovnik, B. 65

Pollet, P., Gelin, S.: A One-Step Synthesis of γ,δ-Unsaturated β-Ketoesters 142

Ponti, F., see Santaniello, E. 534, 891

Pozdeyev, A.G., see Akhrem, A.A. 43

Pramod Upadhyaya, V., Surendra Nath, T.G., Srinivasan, V.R.: Synthesis of 5-Aryl-3-propynylthio-*s*-triazoles and their Anellation to 2-Aryl-5-methylthiazolo[3,2-*b*]-*s*-triazoles 288

Prota, G., see Chioccara, F. 744

Putt, S.R., see Baker, D.C. 478

Pytlewski, T., see Jończyk, A. 883

Quan, P.M., see Bamfield, P. 537

Quast, H., Heuschmann, M.: Zur Herstellung von 2,2-Dimethylpropylamin und Tris[2,2-dimethylpropyl]-amin 547

Rajagopalan, K., see Perumal Pillai, T. 539

Ramakrishnasubramanian, S., see Veeramani, K. 855

Ramasamy, K., see Paramasivam, K. 889

Ramasamy, K., Kalyanasundaram, S.K., Shanmugam, P.: Debromination of *vic*-Dibromides using Sodium Hydrogen Telluride Reagent 311

Sodium Hydrogen Telluride – A New Reagent for the Hydrogenation of Carbon-Carbon Double Bonds 545

Ramasamy, K., Murugesan, M., Shanmugam, P.: Tellurium Heterocycles; Part III. Synthesis of Tellurolo[2,3-*b*]quinolines 842

Ramirez, F., Marecek, J.D.: Crystalline 2,4-Dinitrophenyl Dihydrogen Phosphate and Its Monoquinuclidine Salt . . . . . 601 (erratum: 1979, 74)

Ramirez, F., Marecek, J.F., Chaw, Y., McCaffrey, T.: A New Method of Synthesis of Organic Magnesium Pyrophosphate Complexes 519

Rasmussen, J.K., Heilmann, S.M.: A Facile, One-Pot Synthesis of Silylated Cyanohydrins 219

Rawson, D.I., see Giguere, R.J. 902

Reese, C.B., see Chattopadhyaya, J.B. 908

see Jiricny, J. 919

Reich, H.J., Chow, F., Peake, S.L.: Seleninic Acids as Catalysts for Oxidations of Olefins and Sulfides Using Hydrogen Peroxide 299

Reinhoudt, D.N., Trompenaars, W.P., Geevers, J.: Synthesis of Heteroaromatic Compounds with "Enamine" Reactivity 368

Reliquet, A., see Villieras, J. 29

Renfrew, A.H., see Bostock, S.B. 66

Rich, D.H., Tam, J.P.: A Convenient Synthesis of the Amino Acid, 1-Amino-cyclopropane-1-carboxylic Acid 46

Richter, R., see Goerdeler, J. 760

Ried, W., Bopp, H.: Ringerweiterung und Ringverengerung von phenyl-substituierten 4-Oxothiapyran- bzw. 4-Oxo-2,3-dihydro-thiapyran-1,1-dioxiden bei der Schmidt-Reaktion 211

Rieker, A., Dreher, E.L., Geisel, H., Khalifa, M.H.: Elektrochemische Oxidation; III. Herstellung von Chinolen und Chinol-Derivaten durch anodische Oxidation sterisch gehinderter Phenole 851

Rinus, O., see Otto, H.H. 681

Roberts, M.R., see Galakatos, N.G. 472

Rolla, F., see Landini, D. 223, 771

Rosini, G., see Bartoli, G. 436

Rossi, L.M., Trimarco, P.: ν-Triazolines; IX. Synthesis of 1-Benzothiopyrano[3,4-*d*]-[1,2,3]triazole Derivatives 465

ν-Triazolines, X. The Permanganate Oxidation of 1-Aryl-5-(tertiary)-amino-ν-triazolines 743

Rousseau, G., Perchec, P. Le, Conia, J.M.: A Novel Synthesis of α,β-Unsaturated Aldehydes and Esters by Dye-Photooxygenation of Methyl Enol Ethers 67

Rozing, G.P., De Clercq, P., Vandewalle, M.: Synthesis of Pseudoguaianolides; a Study for the Stereocontrol at the 2-Position 225

Rutledge, P.S., see Woodgate, P.D. 152

Ryu, I., Murai, S., Horiike, T., Shinonaga, A., Sonoda, N.: An Improved Procedure for Dicyanodimethylsilane and Cyanotrimethyl-silane 154

Saavedra, J.E., see Maloney, J.R. 212

Saito, K., see Kikugawa, Y. 447

Sakakibara, T., see Itahara, T. 607

Sakurai, A., Hayashi, T., Hori, I., Jindo, Y., Oishi, T.: Conversion of Dithiocarbamates to Iodides via *S*-Alkylation 370

Sakurai, H., see Pac, C. 589

Samain, D., Descoins, C., Commerçon, A.: A Short, Stereoselective Synthesis of 8*E*,10*E*-Dodecadien-1-ol; The Sex Pheromone of the Codling Moth, *Laspeyresia Pomonella, L* 388

Santaniello, E., Ponti, F., Manzocchi, A.: Chromic Acid Adsorbed on Silica Gel: an Oxidant for Primary and Secondary Hydroxy Compounds 534

Reduction of Carbonyl Compounds by Sodium Borohydride Adsorbed on Alumina 891

Sasse, K.: Ein einfaches neues Verfahren zur Herstellung 2-substituierter Chinazoline 379

Sauvêtre, R., see Masure, D. 458

Sauvêtre, R., Masure, D., Chuit, C., Normant, J.F.: Reduction of 1,1,2-Trifluoro-3-hydroxy-1-alkenes with Lithium Tetrahydroaluminate. A New Synthesis of 2-Fluoro-2-alkenals 128

Savignac, P., see Coutrot, P. 34, 36, 133

Savignac, P., Coutrot, P.: A Direct Conversion of Aldehydes into 2-Oxoalkanephosphonates via the Diethyl α-Lithiochloromethanephosphonate Anion 682

Schamp, N., see De Kimpe, N. 895

Schamp, N., see Verhé, R. 530

Schank, K., Schuhknecht, C.: Sulfur Ylides (Sulfuranes) from Active Methylene Compounds and Dimethyl Sulfoxide; A Useful Alternative to Known Methods 678

Scheeren, J.W., see Aben, R.W. 400

Scheeren, J.W., Goossens, H.J.M., Top, A.W.H.: Electrochemical Methoxylation of Acetals. A Simple Procedure for the Synthesis of Orthoesters 283

Schiess, P., Suter, C.: Photochemische Bildung zweier [2+2]-Dimeren von Cyclopentadienon aus 5-Acetoxy-3-oxocyclopenten 543

Schmelz, H., see Otto, H.H. 681

Schmidt, H., see Steglich, W. 622

Schmidt, U., Schölm, R.: Optisch aktive Pyrrolidin-Derivate aus L-Glutaminsäure. Bemerkungen zur Diboran-Reduktion von Ammonium- und Alkali-carboxylaten 752

Schmidt, U., Steindl, F.: Über die Herstellung von Aminosäure-*t*-butylthioester und deren Verwendung in der Peptid-Synthese 544

Schölm, R., see Schmidt, U. 752

Schoufs, M., Meijer, J., Vermeer, P., Brandsma, L.: Synthesis of γ,δ-Unsaturated Dithioacids, 1-Alkenyl Alkanedithioates, and γ-Dithiolactones from 2-Alkenyl Alkanedithioates ... 435

Schubert, U.: The Homologation of Hagemann's Ester 364

Schuhknecht, C., see Schank, K. 678

Schumacher, W., see Hanack, M. 26

Schwentner, J., see Thiem, J. 696

Seitz, G., Sutrisno, R.: Ethoxycarbonylisothiocyanat als Reagenz zur Einführung von Thioxo-Funktionen in Quadratsäure-amide ... 831

Senda, S., Hirota, K., Assao, T., Yamada, Y.: A Facile Synthesis of Pyrrolo[3,4-*d*]pyrimidines and Pyrimido[4,5-*d*]pyridazines 463

Severin, T., see Lerche, H. 687

Severin, T., Ipach, I.: Umsetzungen mit Nitroenaminen; XVII. Synthese von 5-Nitroazulenen 592

Shanmugam, P., see Paramasivam, K. 889

see Ramasamy, K. ... 311, 545, 842

see Veeramani, K. 855

Shibuya, S., see Kano, S. 305, 372, 746

Shinonaga, A., see Ryu, I. 154

Simchen, G., see Eisele, G. 757

Singh, B., Lesher, G.Y.: Convenient Preparations of Ethyl 3-Oxopentanoate and 3,5-Disubstituted 1,2-Oxazole-4-carboxylic Acids from a Common Type of Intermediate 829

Sivanandaiah, K.M., see Anwer, M.K. 751

see Khan, S.A. 750

Šket, B., Zupan, M.: Photoreaction of Pentafluoropyridine with Cyclohexane. Evidence for Regiospecific Substitution 760

Skötsch, C., Breitmaier, E.: Synthese des 18,19-Dioxo-17,18,19,20-tetrahydrotribenzo-[*b,f,l*][1,4,8,11]tetraazacyclotetradecin-Systems ohne Anwendung des Metalltemplat-Effektes 680 (erratum: 1979, 152)

Skrowaczewska, Z., see Hordziejewicz, F. 585

Smith, D.J.H., see Finlay, J.D. 579

Smith, J.G., Irwin, D.C.: α-Iminonitriles (Imidoyl Cyanides); Their Preparation using Phase-Transfer Catalysis and Their Reductive Dimerization 894

Snoussi, M., see Coutrot, P. 133

Somehara, T., see Miyano, S. 701

Sonoda, N., see Ryu, I. 154

Sosnovsky, G., Konieczny, M.: Introduction of Selenium into Organophosphorus Compounds Containing the Aziridinyl and Stable Nitroxyl Groups 583

Sosnovsky, G., Krogh, J.A.: A Versatile Method for the Conversion of Aldoximes to Nitriles Using Selenium Dioxide 703

Sousa, L.R., see Johnson, M.R. 317

Srinivasan, V.R., see Pramod Upadhyaya, V. ... 288

Stammer, C.H., see Konno, S. 598

Stanovnik, B., Tišler, M., Polanc, S., Gračner, M.: Reduction of Heterocyclic Azides into Amines with Titanium(III) Chloride 65

Stec, W.J., see Krzyzanowska, B. 521

see Kudzin, Z.H. 469

see Uznanski, B. 154

Steckhan, E., see Wellmann, J. 901

Steglich, W., see Möller, R. 620

Steglich, W., Schmidt, H., Hollitzer, O.: Aktivierte Carbonsäure-Derivate; II. Eine einfache Synthese von 2-Oxocarbonsäureamiden, *N*-(2-Oxoacyl)-aminosäure-estern und 2-Oxocarbonsäure-hydraziden 622

Steindl, F., see Schmidt, U. 544

Still, I.W.J., Turnbull, K.: Reduction of Sulfilimines to Sulfides with Phosphorous Pentasulfide 540

Strandtmann, M. von, see Connor, D.T. 208

Sturtz, G., see Baboulene, M. 456

Subramaniam, C.S., Thomas, P.J., Mamdapur, V.R., Chadha, M.S.: Synthesis of 2-(6-Methoxycarbonylhexyl)-cyclopentane-1,3,4-trione, A Prostaglandin Intermediate 468

Sugihara, H., Tanikaga, R., Kaji, A.: A Useful Method for the Conversion of Sulfoxides to Aldehydes 881

Sullivan, T.J., see Pearson, D.E. 127

Sumoto, K., see Miyano, S. 451, 701

Surendra Nath, T.G., see Pramod Upadhyaya, V. 288

Suri, S.C., see Mehta, G. 374

Surya Prakash, G.K., see Olah, G.A. 397, 825

Suter, C., see Schiess, P. 543

Sutrisno, R., see Seitz, G. 831

Suzuki, E., Katsuragawa, B., Inoue, S.: An Efficient *O*-Methylation of 4-Hydroxy-2-pyrones and 4-Hydroxycoumarin 144

Suzuki, H., Fuchita, T., Iwasa, A., Mishina, T.: Diphosphorous Tetraiodide as a Reagent for Converting Epoxides into Olefins, and Aldoximes into Nitriles under Mild Conditions 905

Suzuki, M., see Nunami, K. 840

Suzuki, M., Nunami, K., Matsumoto, K., Yoneda, N., Miyoshi, M.: A Facile Synthesis of 1-Oxo-1,2-dihydroisoquinoline-3-carboxylate and 2-Pyridone-6-carboxylate Derivatives . . . 461

Swaminathan, S., see Perumal Pillai, T. 539

Swern, D., see Huang, S.L. 297

Szarek, W.A., see Kim, K.S. 48

Takagi, S., see Hojo, M. 284

Takahagi, Y., see Kano, S. 372

Takahashi, K., Kimura, S., Ogawa, Y., Yamada, K., Iida, H.: A Convenient Synthesis of α,β-Disubstituted Cinnamonitriles (1-Anilino-2-cyano-1,2-diphenylethenes) 892

Takeda, K., see Miyano, S. 451

see Ogura, H. 394

Tam, J.P., see Rich, D.H. 46

Tamoto, K., see Morooka, S. 445

Tamura, Y., Chun, M.W., Inoue, K., Minamikawa, J.: A Novel Synthesis of Biaryls from Diaryliodonium Salts 822

Tanaka, M., see Alper, H. 781

Tanikaga, R., see Sugihara, H. 881

Tardella, P.A., see Di Bello, N. 227

Tarnowski, B., see Meth-Cohn, O. 56, 58

Tashiro, M., Yamato, T.: Studies on Selective Preparation of Aromatic Compounds, 17. A New Route for the Preparation of 10,11-Dihydro-5*H*-dibenzo[*a,d*]cycloheptene 214

Studies on Selective Preparation of Aromatic Compounds; 19. A Convenient Synthesis of 8,16-Dimethyl[2,2]metacyclophane 435

Tashiro, M., Yoshiya, H., Yamato, T.: Studies on Selective Preparation of Aromatic Compounds; 18. A New Preparative Method for Aryl 4-Hydroxyphenyl Ethers 399

Tatibouët, F., see Merour, J.Y. 698

Tavernari, D., see Bartoli, G. 436

Taylor, R.J.K., see Lombardo, L. 131

TenBrink, R.E., see McCall, J.M. 673

Tewari, R.S., Chaturvedi, S.C.: A Facile Synthesis of Substituted 4-Acetylstilbenes 616

Thiem, J., Karl, H., Schwentner, J.: Synthese α-verknüpfter 2'-Deoxy-2'-jododisaccharide . . . 696

Thomas, P.J., see Subramaniam, C.S. 468

Throck, Watson, J., see Pearson, D.E. 127

Tigyi, J., see Hideg, K. 914

Tišler, M., see Stanovnik, B. 65

Tokue, R., see Ogura, H. 394

Tong, Y.C., see Liu, K.T. 669

Top, A.W.H., see Scheeren, J.W. 283

Trimarco, P., see Rossi, L.M. 465, 743

Trompenaars, W.P., see Reinhoudt, D.N. 368

Trost, B.M., Vladuchick, W.C.: A Convenient Laboratory Synthesis of Cyclobutanone 821

Tundo, P.: Easy and Economical Synthesis of Widely Porous Resins; Very Efficient Supports for Immobilized Phase-Transfer Catalysts . . . 315

Turnbull, K., see Still, I.W.J. 540

Turnbull, M.M., see Comins, D.L. 309

Tyka, R., see Oleksyszyn, J. 479

Uchida, T., see Matsumoto, K. 207

Uff, B.C., Budhram, R.S.: Studies with Reissert Compounds; Part VII. A Synthesis of the Pyrrolo[2,1-*a*]phthalazine System 206

Ungaro, R., see Pochini, A. 617

Unterhalt, B., Leiblein, F.: Nitramine; XII. Synthese von Fluoromethylalkylnitraminen 700

Uznanski, B., Stec, W.J.: An Improved Preparation of Trimethylsilyl Cyanide 154

Valentino, D.S., see Calò, V. 139

Valery, J.M., see Georgoulis, C. 402

Valnot, J.-Y.: Reaction of Activated Methylene Compounds with α-Aminoimines; A New Synthesis of Pyrroles 590

Vandewalle, M., see Rozing, G.P. 225

Van Erkelens, P.A.E., see Benders, P.H. 775

Vankar, Y.D., see Olah, G.A. 702

Veeramani, K., see Paramasivam, K. 889

Veeramani, K., Paramasivam, K., Ramakrishnasubramanian, S., Shanmugam, P.: Photolysis of 4-Phenyl-3-vinylquinolines; A Facile New Route to the Benzo[*k*]phenanthridine System 855

Venkov, A.P., see Mollov, N.M. 62

Verboom, W., Meijer, J., Brandsma, L.: A Convenient Method for the Introduction of a Vinylthio Group 577

Verhé, R., see De Kimpe, N. 895

Verhé, R., De Kimpe, N., De Buyck, L., Courtheyn, D., Schamp, N.: Preparation of 2,2-Dialkylcyclopropanes Geminally Substituted with Electron-Withdrawing Groups . . . 530

Verkruijsse, H.D., see Brandsma, L. 290

Vermeer, P., see Schoufs, M. 439

see Westmijze, H. 454

Vernin, G., Metzger, J.: A Convenient General Synthesis of 3-Alkyl-1,3-diaryltriazenes from 1,3-Diaryltriazenes using Phase-Transfer Catalysis 921

Villieras, J., see Perriot, P. 33

Villieras, J., Perriot, P., Normant, J.F.: α-Chloroenolates; VI. Diethyl 1-Chloro-1-lithio-2-oxoalkanephosphonates; Synthesis of α-Chloro-α,β-unsaturated Ketones 29

α-Haloenolates; VII. Diethyl 1-Chloro-1-ethoxycarbonyl-1-lithiomethanephosphonate; A Convenient One-Step Preparation of α-Chloro-α,β-unsaturated Esters from Diethyl Trichloromethanephosphonate 31

Villieras, J., Reliquet, A., Normant, J.F.: Nucleophilic Alkylation of Carbenoids; III. Copper(I)-Catalysed Replacements of the Chlorine Atoms in 1,1-Dichloroalkanephosphonates by Various Substituents 29

Vladuchick, W.C., see Trost, B.M. 821

Vögtle, F., see Buhleier, E. 155

Voss, J., Günther, H.: Aktivierte Thiocarbonsäure-ester; 6. Eine einfache und vielseitige Herstellungsmethode für 1,1-Dithiooxalsäureester 849

Wagner, K., see Findeisen, K. 38, 40

Wald, K., Breitmaier, E.: Herstellung von 1*H*-Pyrimido[4,5-*c*][1,2]diazepin-Derivaten . . . 748

Wallace, J.K., see Galakatos, N.G. 472

Ward, R.S., see Pelter, A. 843

Wehner, W., see Buhleier, E. 155

Wellmann, J., Steckhan, E.: Reductive Coupling of Benzylic and Allylic Halides with Catalytic Amounts of Chromium(II) Reagent Using an Electrochemical Regeneration Procedure . . . 901

Werner, K.v., see Manhart, E. 705

Westmijze, H., Kleijn, H., Vermeer, P.: A New, Stereospecific Synthesis of 2-Alkenenitriles from 2-Alkynenitriles and Organocuprates . . . 454

Whiteley, R.V., Marianelli, R.S.: The Synthesis of 2,3-Disubstituted Succinodinitriles 392

Will, W., see Anders, E. 899

Woodgate, P.D., Lee, H.H., Rutledge, P.S., Cambie, R.C.: Synthesis of Vicinal Iodoselenocyanates 152

Wulfman, D.S., Cooper, C.F.: Monoreduction of Dinitroarenes with Iron/Acetic Acid 924

Yagupolskii, L.M., Maletina, I.I., Kondratenko, N.V., Orda, V.V.: A New Method of Perfluoroalkylation 835

Yamada, K., see Takahashi, K. 892

Yamada, S., see Kikugawa, Y. 447

Yamada, Y., see Senda, S. 463

Yamamoto, Y., see Ando, N. 688

Yamato, T., see Tashiro, M. 214, 399, 435

Yokomatsu, T., see Kano, S. 305

Yoneda, N., see Nunami, K. 840

see Suzuki, M. 461

Yoshiya, H., see Tashiro, M. 399

Young, P.A., see Connor, D.T. 208

Yus, M., see Barluenga, J. 911

Zabrocki, J., see Górecka, A. 474

Zecchi, G., see Chiodini, L. 603

Zumbulyadis, N., see Chen, C.H. 667

Zupan, M., see Sket, B. 760

Zwierzak, A., see Górecka, A. 474

see Kluba, M. 134, 770

Zygmunt, J., Kafarski, P., Mastalerz, P.: Preparation of Oxoalkanephosphonic Acids . . . 609

Compound Index 945

Reaction Index 970

Index of Special Reagents 976

Index of Laboratory Techniques 978

Errata 979

Authors' Guidelines 981

COMPOUND INDEX

Reaction Index p. 970
Index of Special Reagents p. 976
Index of Apparatus, Laboratory Techniques, etc. p. 978

SYNTHESIS 1978

● **Acetal Derivatives**
- ***S,S*-Acetal *S*-Oxides**
- Synthesis 758
● **Acetals (including Thioacetals)**
see also: Methylal
- ***O,O*-Acetals**
- Synthesis 161 (5111), 209, 318 (5153), 719, 826
- Reactions 63, 283, 326 (5173), 556 (5251), 556 (5254), 788 (5306), 825, 836 (5335), 835 (5341)
- ***S,S*-Acetals**
- Synthesis 164 (5120), 239 (5149), 555 (5248), 719, 826
- Reactions 407 (5189), 556 (5252), 718, 758
- ***O*-Alkyl *O'*-Silyl Acetals**
- Synthesis 309
- ***S*-Alkyl *O*-Silyl Acetals**
- Synthesis 325 (5170)
- **α-Bromo-*O,O*-acetals**
- Reactions 485 (5218)
- **Malodialdehyde Bis-acetals**
- Reactions 748
- **Mono-*O,O*-acetals of *vic*-Diketones**
- Synthesis 857
- **α,β-Unsaturated *O,O*-Acetals**
- Synthesis 866 (5344)
- **α,β-Unsaturated *S,S*-Acetals**
- Synthesis 826
● ***CH*-Acidic Compounds**
- Reactions 56, 58, 304, 310, 687
● **Acylals, Semiacylals, and Derivatives**
- ***O*-Semiacylal Halides**
- Synthesis 593
● **Acyl Sulfonates**
- Synthesis and Reactions 735
● **(*S*)-(+)-Alanine**
- Synthesis 331
● **Alcohols (including *O*-Acyl and *O*-Sulfonyl Derivatives)**
- from Epoxides 709 (5284)
- from Like Carbon Skeletons 825
- Reactions 75 (5100), 164 (5121), 231 (5123), 232 (5127), 402, 407 (5188), 452, 708 (5283), 721, 814, 862 (5330), 929, 944 (5375)
- **2,3-Alkadienols**
- Synthesis 528
- **2,4-Alkadienols**
- Reactions without Cyclization 388
- **2,6-Alkadienols**
- Synthesis 423
- **8,10-Alkadienols**
- Synthesis 388
- **Alkanols**
- Synthesis 483 (5214)
- Reactions without Cyclization 71 (5086) (5088), 405 (5181)
- **2-Alkenols (Allylic Alcohols)**
- Synthesis 128, 160 (5108), 215, 322 (5162), 528, 620, 726
- Cyclopropanation 87
- Epoxidation 76 (5101), 484 (5217)
- Reactions without Cyclization 160 (5109), 162 (5115), 231 (5123), 235 (5136), 236 (5138), 481 (5208), 549 (5230), 630 (5270) (5271), 848
- **3-Alkenols**
- Synthesis 162 (5115), 549 (5230), 860 (5323)
- **2-Alkoxyalkanols**
- Synthesis 862 (5330)
- **3-Alkoxy-2-alkenols**
- Synthesis 941 (5367)
- Reactions without Cyclization 620, 941 (5367)
- **2-Alkynols**
- Synthesis 938 (5356)
- Reactions without Cyclization 408 (5192) (5193), 864 (5338)
- **3-Alkynols**
- Synthesis 26
- **2-Aminoalkanols**
- Synthesis 409 (5195), 862 (5330)
- **1-Arylalkanols and Hetero Analogs**
- Synthesis 724, 936
- Reactions without Cyclization 397
- **Bis[1-alkynyl]-carbinols**
- Synthesis 307
- **Cycloalkanols**
- Synthesis 147
- **Cyclopropylcarbinols**
- Synthesis and Reactions 821
- **1,2-Diarylalkanols and Hetero Analogs**
- Synthesis 149
- **Diarylcarbinols**
- Reactions without Cyclization 397, 936
- **2-Haloalkanols**
- Synthesis 402, 553 (5243), 605
- Reactions without Cyclization 483 (5214)
- **3-Haloalkanols**
- Synthesis 627 (5262)
- **2-Halo-2-alkenols**
- Synthesis 320 (5155), 458
- **3-Hydroxy-1,5-alkadienes**
- Synthesis 320 (5156), 612, 934
- Reactions 612, 934
- **1-Hydroxyalkyl-1,3-benzothiazoles**
- Synthesis and Reactions 939 (5358)
- **2-Mercaptoalkanols and *S*-Derivatives**
- Synthesis 322 (5161), 862 (5330)
- Reactions without Cyclization 710 (5287)
- **Primary Alcohols**
- Synthesis 709 (5285), 752, 862 (5332), 891
- Reactions 297, 320 (5157), 534, 790 (5311) (5312), 868 (5350)
- **Secondary Alcohols**
- Synthesis 348, 407 (5189), 423, 676, 790 (5311) (5312), 860 (5328), 891, 899
- Reactions 239 (5147), 297, 320 (5157), 488 (5229), 534
- **2-Selenylalkanols and *Se*-Derivatives**
- Synthesis 862 (5330)
- Reactions without Cyclization 710 (5287)
- **3-Selenylalkanols and *Se*-Derivatives**
- Synthesis and Reactions 860 (5323)
- **Tertiary Alcohols**
- Synthesis 162 (5114), 407 (5189), 861 (5328), 899, 934
- Reactions 162 (5114), 737
- **1,1,2-Triarylalkanols and Hetero Analogs**
- Synthesis 149
- **Triarylcarbinols**
- Reactions 397
● **Aldehydes**
- from Like Carbon Skeletons 297, 320 (5157), 410 (5197) (5199), 534, 735, 737, 790 (5311) (5312), 865 (5341), 866 (5345), 881, 941 (5366), 919
- from Unlike Carbon Skeletons 403, 555 (5248), 725
- Cyclization Reactions 35, 162 (5113), 239 (5149), 400, 443
- Oxirane Formation 625 (5255), 823
- Reactions without Cyclization 131, 133, 162 (5115), 163 (5117), 164 (5120), 219, 233 (5129), 236 (5139), 238 (5146), 239 (5149), 301, 321 (5159), 322 (5162), 325 (5170), 392, 470, 479, 553 (5242), 556 (5254), 593, 625 (5255), 628 (5264), 711 (5291), 715, 719, 790 (5313), 791 (5316), 859 (5322), 861 (4328), 862 (5332), 863 (5333), 891, 899, 938 (5357), 940 (5362), 941 (5367), 942 (5370)
- **Alkanals**
- Synthesis 73 (5094), 160 (5109), 235 (5135), 236 (5139), 625 (5255), 671, 897, 952 (5368)
- Reactions without Cyclization 141, 324 (5169), 409 (5196), 860 (5323), 896
- **2-Alkenals**
- Synthesis 64, 67, 162 (5114), 235 (5135) (5136), 237 (5142), 312, 321 (5159), 409 (5196), 556 (5251), 629 (5269), 848, 941 (5367)
- Cyclization Reactions 52, 159 (5105), 748
- Reactions without Cyclization 160 (5108), 235 (5135), 250, 325 (5170), 608
- **4-Alkenals**
- Synthesis 235 (5137), 789 (5309)
- **2-Alkynals**
- Synthesis 307
- **Aromatic Aldehydes**
- Synthesis 56, 58, 149, 159 (5106), 179, 212, 608, 616, 617, 619, 936
- Cyclization Reactions 179, 486 (5223)
- Epoxide Formation 552 (5241)
- **Cycloalkadienecarboxaldehydes**
- Synthesis 52
- **4-Cyanoalkanals**
- Synthesis 589
- **Cycloalkanecarboxaldehydes**
- Reactions without Cyclization 68
- **2,3-Epoxyalkanals**
- Synthesis 236 (5138)
- **α-Haloaldehydes**
- Synthesis 141
- **2-Halo-2-alkenals**
- Synthesis 128, 320 (5155), 458
- ***N*-Heterocyclic Aldehydes**
- Synthesis 810
- Reactions 295
- ***O*-Heterocyclic Aldehydes**
- Synthesis 209
- **2-Hydroxyalkanals and *O*-Derivatives**
- Synthesis 725, 733
- **3-Hydroxy-2-alkenals and *O*-Derivatives**
- Synthesis 621
- **5-Hydroxy-2-alkenals and *O*-Derivatives**
- Synthesis 768 (5306)

- **5-Hydroxy-2-oxoalkanals and Derivatives**
- Synthesis 390
- ***o*-Isothiocyanatocinnamaldehydes**
- Synthesis 810
- **Long-Chain Oxoaldehydes**
- Synthesis 240 (5151)
- **2-Mercaptoalkanals and *S*-Derivatives**
- Reactions without Cyclization 940 (5364)
- **3-Mercapto-2-alkenals and *S*-Derivatives**
- Synthesis 621
- **Oxoaldehydes, General**
- Cyclization Reactions 405 (5183)
- **3-Oxoalkanals**
- Synthesis and Cyclization Reactions 931
- **4-Oxoalkanals**
- Cyclization Reactions 786 (5300) (5301)
- **5-Oxoalkanals**
- Cyclization Reactions 786 (5300)
- **Polyenals**
- Synthesis 161 (5112)
- **2-Siloxy-4-alkenals**
- Synthesis and Reactions 630 (5270) (5271)

● **Alkaloids and Relatives**
- **Amaryllidaceae Alkaloids**
- Synthesis 515
- **Aporphine-Type Alkaloids**
- Synthesis 500, 501, 502
- **Augustolidine**
- Synthesis 518
- **Benzophenanthridine-Type Alkaloids**
- Synthesis 509
- **Benzylisoquinoline-Type Alkaloids**
- Synthesis 335
- **Berberine-Type Alkaloids**
- Synthesis 504, 509
- **Chelidonine**
- Synthesis 800
- **Crinan**
- Synthesis 516
- **Homopapaverin Derivatives**
- Synthesis 149
- **Isoquinoline-Type Alkaloids**
- Synthesis 335

● **Alkanes**
- from Like Carbon Skeletons 71 (5086), 716, 736
- from Unlike Carbon Skeletons 714, 732

● **Alkenes**
- from Episulfides 738
- from Epoxides 905
- from *O*-Heterocyclic Compounds 815
- from Like Carbon Skeletons 234 (5133), 311, 321 (5160), 861 (5329)
- from Unlike Carbon Skeletons 72 (5091), 231 (5123), 732, 860 (5324)
- Cyclization Reactions 210, 328 (5178)
- Cyclopropanation 80, 939 (5359)
- Epoxidation 484 (5217)
- Reactions without Cyclization 24, 152, 217, 321 (5160), 343, 402, 482 (5211), 546, 553 (5243), 676, 787 (5305), 859 (5321), 865 (5342), 867 (5348)
- **1,3-Alkadienes**

see: Dienes (conjugated)
- **1,4-Alkadienes**
- Synthesis 528, 532
- Reactions without Cyclization 532
- **1,5-Alkadienes**
- Reactions without Cyclization 532
- **1-Alkenes**
- Synthesis 72 (5090), 708 (5282), 722, 785 (5298), 859 (5322)
- Double-Bond Shifts 754
- Reactions without Cyclization 551 (5238), 626 (5260), 708 (5281), 709 (5285)
- **2-Alkenes**
- Synthesis 708 (5282)
- ***C*-(1-Alkenyl)-heterocyclic Compounds**
- Synthesis 938 (5357), 939 (5358)
- **Alkylidenecycloalkanes**
- Synthesis 735
- **Alkylidene-*N*-heterocyclic Compounds**
- Synthesis 608
- **Alkylidene-*O*-heterocyclic Compounds**
- Synthesis 608
- **Alkylidene-*S*-heterocyclic Compounds**
- Synthesis 608
- **1,1-Diaryl-1-alkenes**
- Synthesis 604, 723
- **Exomethylene Compounds**
- Reactions involving Ring Transformation 319 (5153)
- **Non-Conjugated Dienes and Polyenes**
- Synthesis 730, 902
- Cyclization Reactions 911
- Epoxidation 605
- Reactions without Cyclization 605, 712 (5294)
- **Non-Terminal Alkenes**
- Synthesis 321 (5158), 468, 482 (5210), 711 (5292), 754
- Epoxidation 300

● **Alkoxycarbonyl Thiosulfinates**
- Synthesis and Reactions 783

● **Alkoxycarbonyl Thiosulfonates**
- Synthesis 783

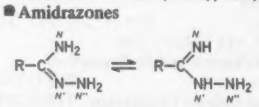
● **Alkynes**
- Cyclization Reactions 3–7
- Reactions without Cyclization 322 (5162), 549 (5231), 671, 723
- **1-Alkynes**
- Synthesis 231 (5124)
- Cyclopropane Formation 838
- Reactions without Cyclization 159 (5104), 163 (5116), 325 (5171), 462, 626 (5258)
- **1-Aryl-1-alkynes and Hetero Analogs**
- Synthesis 306
- **Diarylacetylenes**
- Synthesis 902
- **Non-Conjugated Diynes**
- Cyclization Reactions 798, 939 (5360)
- **Non Terminal Alkynes**
- Synthesis 408 (5193)
- Cyclopropenation 82, 85, 98, 99, 107
- Reactions without Cyclization 231 (5124), 462

● **Allenes**
- Synthesis 408 (5192), 785 (5298)
- Reactions 79, 88, 116
- **1,2,4-Alkatrienes**
- Synthesis 529
- **Bis-allenes**
- Reactions 13
- **Exocyclic Allenes**
- Synthesis 86
- **Functionally Substituted Allenes**
- Synthesis 410 (5198), 427, 528

● **Amidines**
- **Arenecarboxamidines**
- Synthesis 40
- Cyclization Reactions 40, 524
- ***N*-(Polyfluoroalkylidene)-amidines**
- Synthesis 524
- Reactions 524, 527

● **Amide Acetals**
- **Formamide *O,O*-Acetals**
- Reactions 412 (5206), 757, 864 (5338)

● **Amidrazones**



- Cyclization Reactions 559, 560, 561, 575, 813

● **Amine Oxides**
- Synthesis and Reactions 72 (5090)

● **Amines**
- **Alkanamines**
- Synthesis 409 (5194), 484 (5216), 547, 553 (5242)
- Reactions without Cyclization 737
- **1-Alkenamines**

see: Enamines
- **Aminocyclobutenediones**
- Synthesis 19, 650, 874
- ***C*-Amino-*N*-heterocyclic Compounds**
- Synthesis 65, 380, 673, 844, 909
- Cyclization Reactions 272
- ***C*-Amino-*S*-heterocyclic Compounds**
- Synthesis 368
- **Aminomethylarenes**
- Synthesis 933
- **Arenamines**
- Synthesis 23, 436, 834, 924
- Reactions 234 (5132), 238 (5144), 406 (5185), 539, 836, 911
- **Macrocyclic (Mono-, Bi-, and Polycyclic) Amines**
- Synthesis 155
- **Primary Amines**
- Synthesis 24, 721, 724, 735, 787 (5303)
- Reactions 244, 328 (5178), 395, 474, 552 (5239), 766, 804, 862 (5330), 937 (5352) (5353)
- **Secondary Amines**
- Synthesis 711 (5292), 752, 781, 787 (5303)
- Reactions 71 (5088), 766, 808, 844, 862 (5330)
- **Tertiary Amines**
- Synthesis 71 (5088), 72 (5090), 547, 757, 766
- Reactions 72 (5090), 743

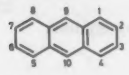
● **Aminium Salts**
- **Fulvenylmethanaminium Salts**
- Reactions 592

● **Amino Acids and Derivatives**

see also the individual Amino Acids
- Reactions 474, 488 (5227), 614, 622
- ***N*-Acylamino Acid 2-Alkenyl Esters**
- Synthesis and Reactions 621
- ***N*-Acylamino Acid Esters**
- Reactions 549 (5230)
- ***N*-Acylamino Acids**
- Reactions 544
- **Amino Acid Anhydrides**
- Synthesis 928
- **Amino Acid Thioesters**
- Synthesis 544
- **α-Amino-α-alkylthio(arylthio)carboxylic Acids and Derivatives**
- Synthesis 53
- **α-Aminocarboxylic Acids and Derivatives**
- Synthesis 331, 340
- Reactions 46, 76 (5102), 240 (5152), 317, 412 (5206), 915
- **ω-Aminocarboxylic Acids and Derivatives**
- Synthesis 488 (5228)
- **β-Aminocarboxylic Esters**
- Synthesis 487 (5226)
- **α-Amino-α-(1-cycloalkenyl)-carboxylic Acids**
- Synthesis 840
- **Aminocyclopropanecarboxylic Acids and Derivatives**
- Synthesis 46
- **α-Amino-α-halocarboxylic Acids and Derivatives**
- Synthesis and Reactions 53
- **α-Amino-α-hydroxycarboxylic Acids and Derivatives**
- Synthesis and Reactions 53
- **α-Amino-α-sulfonylcarboxylic Acids and Derivatives**
- Synthesis and Reactions 53
- **Free α-Aminocarboxylic Acids**
- Synthesis 412 (5206), 712 (5295)
- Reactions 412 (5206), 418
- **Unsaturated Amino Acids and Derivatives**

see also: Carboxylic Acid Esters, Carboxylic Acids, etc.

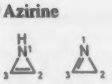
- Synthesis 240 (5152)
● **Aminodicyanomethyls**
- Synthesis 271
● **Aminosulfur Trihalides**
- Synthesis 738
● **Anilines**
see: Amines (Arenamines)
● **Anthracene**



- **Anthracenes**
- Transannular Reactions 437, 902
● **Araliphatic Compounds**
- **Arylalkanes**
- Synthesis 159 (5106), 397
- ***gem*-Diarylalkanes**
- Synthesis 397
- Reactions 396
- **1,2-Diarylalkanes**
- Synthesis 902
- Cyclization Reactions 435
- **Diarylmethanes**
- Synthesis 159 (5106), 763
- Reactions 214
- **Triarylmethanes**
- Synthesis 397
● **Arenes**
- from Like Carbon Skeletons 737
- Reactions with Retention of the Ring Skeleton 323 (5164), 789 (5310), 943 (5372)
● **Arsine Oxides**
- Reactions 785 (5299)
● **Arsines**
- **1-Alkenyldiarylarsines**
- Reactions 707 (5279)
- **Alkyldiarylarsines**
- Synthesis and Reactions 707 (5279)
- **Triarylarsines**
- Reactions 616
● **Arsonium Salts**
- Synthesis and Reactions 616
● **Arynes**
- Generation and Reactions 595
● **1-Azabicyclo[2.2.2]octane**

- **1-Azoniabicyclo[2.2.2]octane Salts (Quinuclidinium Salts)**
- Ring Synthesis 188
● **Azete**

- **Azetidines**
- from Like Ring Skeletons 747
- Ring Synthesis 328 (5178)
● **Azido Compounds**
- **Azidoalkanes**
- Synthesis 24, 232 (5127), 313
- Cyclization Reactions 569
- Reactions without Cyclization 24
- **1-Azido-1-alkenes**
- Synthesis and Reactions 483 (5215)
- **1-Azido-2-alkenes**
- Synthesis 705
- Cyclization Reactions 706
- **Azidoarenes**
- Cyclization Reactions 465
- ***C*-Azido-*N*-heterocyclic Compounds**
- Reactions without Cyclization 65
- ***gem*-Azidosiloxy Compounds**
- Synthesis and Reactions 553 (5242)
● **Azidosulfuric Acid Esters**
- **Aryl Azidosulfates**
- Reactions 357
● **Azirine**

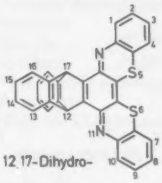


1*H*- 2*H*-

- **2*H*-Azirines**
- Ring Transformation 487 (5225)
- **Aziridines**
- Ring Synthesis 556 (5253), 734
● **Azlactones**
- Synthesis and Reactions 596
● **Azo Compounds**
see: Diazenes
● **Azulene**

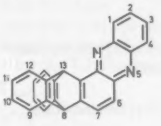
- **Azulenes**
- Ring Synthesis 246, 592
- **1,2,3,3a-Tetrahydroazulenes**
- Ring Synthesis 278
- **Decahydroazulenes**
- from Like Ring Skeletons 225

● **Benzenes**
- Ring Transformation 83
● **12,17-*o*-Benzeno[1,4]benzothiazino[3,2-*c*]naphtho[2,3-*a*]phenothiazine**



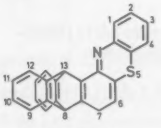
12,17-Dihydro-

- Ring Synthesis 438
● **8,13-*o*-Benzenonaphtho[2,3-*a*]phenazine**



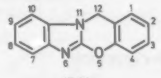
8,13-Dihydro-

- Ring Synthesis 438
● **8,13-*o*-Benzenonaphtho[2,3-*a*]phenothiazine**



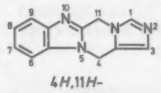
8,13-Dihydro-7*H*-

- Ring Synthesis 438
● **Benzimidazo[2,1-*b*][1,3]benzoxazine**



12*H*-

- Ring Synthesis 807
● **Benzimidazo[1,2-*a*]imidazo[3,4-*d*]pyrazine**

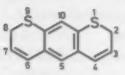


4*H*,11*H*-

- Ring Synthesis 313
● **Benzimidazole**

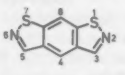
2*H*-

- Anellation Reactions 313
● **Benzo[1,2-*b*; 5,4-*b'*]bisthiapyran**

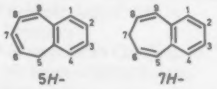


2*H*,8*H*-

- Ring Synthesis 58
● **Benzo[1,2-*d*;5,4-*d'*]-bis[1,2-thiazole]**

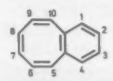


- Ring Synthesis 58
● **Benzocycloheptene**

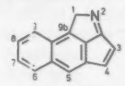


5*H*- 7*H*-

- **5*H*- and 7*H*-Benzocycloheptenes**
- Ring Synthesis 82
- **6,7-Dihydro-5*H*-benzocycloheptenes**
- Ring Synthesis 405 (5183)
- **6,7,8,9-Tetrahydro-5*H*-benzocycloheptenes**
- Ring Synthesis 319 (5153)
- Ring Transformation 932
● **Benzocyclooctene**

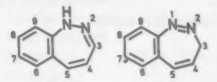


- **5,6,7,8,9,10-Hexahydrobenzocyclooctenes**
- Ring Synthesis 319 (5153), 536
● **Benzo[*g*]cyclopenta[*ed*]isoindole**



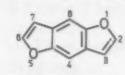
1*H*-

- **2,2a,3,4,4a,5,9b,9c-Octahydro-1*H*-benzo[*g*]-cyclopenta[*ed*]isoindoles**
- Ring Synthesis 796
● **1,2-Benzodiazepine**



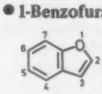
1*H*- 3*H*-

- Ring Synthesis 604
● **Benzo[1,2-*b*;4,5-*b'*]difuran**



- Ring Synthesis 201
● **1,3-Benzodithiole**

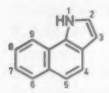
- **1,3-Benzodithiolium Salts**
- Reactions with Retention of the Ring Skeleton 410 (5197)
● **1-Benzofuran**



- **1-Benzofurans**
- Ring Synthesis 66, 201
- **2,3-Dihydro-1-benzofurans**
- from Like Ring Skeletons 476
- **2,4,5,6,7,7a-Hexahydro-1-benzofurans**
- from Like Ring Skeletons 66
- **Octahydro-1-benzofurans**
- Ring Synthesis 476
● **2-Benzofuran**

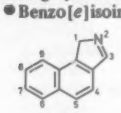
- 1,3-Dihydro-2-benzofurans
- Ring Synthesis 319 (5154)
● Benzo[*cd*]indole

- Benzo[*cd*]indolium Salts
- from Like Ring Skeletons 685
- 1,3-Dihydrobenzo[*cd*]indoles
- Ring Synthesis 685
● Benzo[*g*]indole



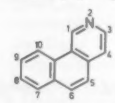
1*H*-

- 2,3,3a,4,5,9b-Hexahydro-1*H*-benzo[*g*]-indoles
- Ring Synthesis 795
● Benzo[*e*]isoindole

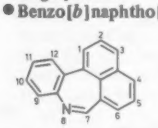


1*H*-

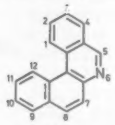
- 2,3,4,5-Tetrahydro-1*H*-benzo[*e*]isoindoles
- Ring Synthesis 796
- 2,3,3a,4,5,9b-Hexahydro-1*H*-benzo[*e*]iso-indoles
- Ring Synthesis 796, 799
● Benzo[*h*]isoquinoline



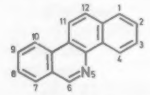
- 1,2,3,4,4a,5,6,10b-Octahydrobenzo[*h*]iso-quinolines
- Ring Synthesis 796, 797
● Benzo[*b*]naphtho[*de*]azepine



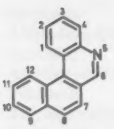
- Ring Synthesis 205
● Benzo[*a*]phenanthridine



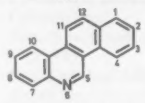
- 5,6,6a,7,8,12b-Hexahydrobenzo[*a*]phen-anthridines
- Ring Synthesis 509
● Benzo[*c*]phenanthridine



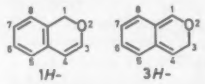
- Benzo[*c*]phenanthridines
- Ring Synthesis 205
- 5,6-Dihydrobenzol[*c*]phenanthridines
- Ring Synthesis 515
- 4a,5,6,10b,11,12-Hexahydrobenzo[*c*]phen-anthridines
- Ring Synthesis 505, 513, 797
● Benzo[*k*]phenanthridine



- Benzo[*k*]phenanthridines
- from Like Ring Skeletons 855
- Ring Synthesis 205
- 5,6-Dihydrobenzo[*k*]phenanthridines
- Ring Synthesis 855
- 5,6,7,8-Tetrahydrobenzo[*k*]phenanthridines
- Ring Synthesis 855
● Benzo[*l*]phenanthridine

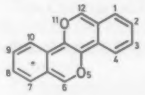


- Benzo[*l*]phenanthridines
- Ring Synthesis 205
- 5,6,8,9,10,10a-Hexahydrobenzo[*l*]phen-anthridines
- Ring Synthesis 509
- 4b,5,6,8,9,10,10a,10b-Octahydrobenzo[*l*]-phenanthridines
- Ring Synthesis 509
● 1-Benzopyran
see: Chromene
● 2-Benzopyran

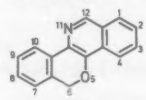


1*H*- 3*H*-

- Isochromans
- Ring Transformation 799
● [2]Benzopyrano[4,3-*c*][2]benzopyran

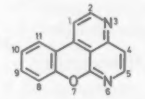


- 4b,6,10b,12-Tetrahydro[2]benzopyrano-[4,3-*c*][2]benzopyrans
- Ring Synthesis 798
● [2]Benzopyrano[4,3-*c*]isoquinoline

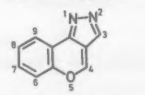


6*H*-

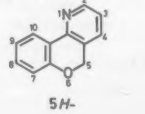
- 4b,10b,11,12-Tetrahydro-6*H*-[2]benzo-pyrano[4,3-*c*]isoquinolines
- Ring Synthesis 798
● [1]Benzopyrano[4,3,2-*de*][1,6]naphthyr-idine



- Ring Synthesis 244
● [1]Benzopyrano[4,3-*c*]pyrazole

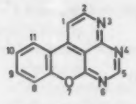


- 2,3-Dihydro[1]benzopyrano[4,3-*c*]pyr-azoles
- Ring Synthesis 779
● [1]Benzopyrano[4,3-*b*]pyridine

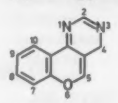


5*H*-

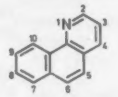
- Ring Synthesis 691
● Benzopyrano[2,3,4-*d'e'*]pyrido[2,3-*d*]-pyr-imidine



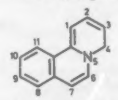
- Ring Synthesis 251
● [1]Benzopyrano[4,3-*c*]pyrimidine



- Ring Synthesis 780
● Benzo[*h*]quinoline

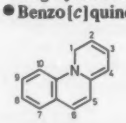


- 1,2,3,4,5,6-Hexahydrobenzo[*h*]quinolines
- Ring Synthesis 507
● Benzo[*a*]quinolizine



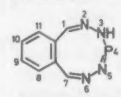
4*H*-

- Ring Synthesis 509
● Benzo[*c*]quinolizine

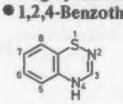


1*H*-

- Ring Synthesis 275
● 2,3,5,6,4-Benzotetraazaphosphonin

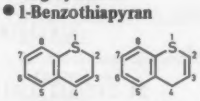


- 4,5-Dihydro-2*H*-2,3,5,6,4-benzotetra-azaphosphonins
- Ring Synthesis 569
● 1,2,4-Benzothiadiazine



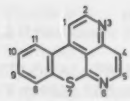
4*H*-

- 4*H*-1,2,4-Benzothiadiazine-1,1-dioxides
- Ring Synthesis 808
● 1-Benzothiapyran



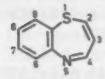
2*H*- 4*H*-

- 2*H*-1-Benzothiapyrans
- Synthesis and Anellation Reactions 465
- 4-Alkylidene-1-benzothiapyrans
- Anellation Reactions 244
- 1-Benzothiapyrylium Salts
- Anellation Reactions 244
- 3,4,5,6,7,8-Hexahydro-2*H*-benzothiapyrans
- Ring Synthesis and Transformation 228
- Thiacoumarins
- Ring Synthesis 56
● [1]Benzothiapyrano[4,3,2-*de*][1,6]naphthyr-idine



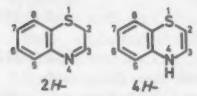
- Ring Synthesis 244

● 1,5-Benzothiazepine



- 2,3-Dihydro-1,5-benzothiazepines
- Ring Synthesis 665

● 1,4-Benzothiazine



2*H*- 4*H*-

- Ring Synthesis 745

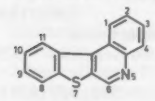
● 1,2-Benzothiazole

- Ring Synthesis 58

● 1,3-Benzothiazole

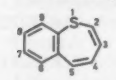
- 1,3-Benzothiazoles
- Ring Synthesis 363
- Reactions with Retention of the Ring Skeleton 436, 938 (5357), 939 (5358)
- 2,3-Dihydro-1,3-benzothiazole 1-Oxides
- Ring Transformation 745

● [1]Benzothieno[2,3-*c*]quinoline



- 5,6,6a,11b-Tetrahydro[1]benzothieno-[2,3-*c*]quinolines
- Ring Synthesis 506

● 1-Benzothiepin

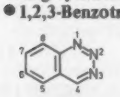


- 2,3,4,5-Tetrahydro-1-benzothiepins
- Ring Synthesis 319 (5153)

● 1-Benzothiophene

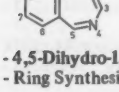
- 1-Benzothiophenes
- Reactions with Retention of the Ring Skeleton 436
- 4,5,6,7-Tetrahydro-1-benzothiophenes
- Ring Synthesis 263, 276

● 1,2,3-Benzotriazine



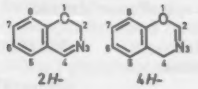
- 3,4-Dihydro-1,2,3-benzotriazines
- Ring Synthesis 383

● 1,4-Benzoxazepine



- 4,5-Dihydro-1,4-benzoxazepines
- Ring Synthesis 780

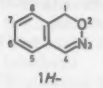
● 1,3-Benzoxazine



2*H*- 4*H*-

- 2*H*-1,3-Benzoxazines
- Ring Synthesis 38
- 3,4-Dihydro-2*H*-1,3-benzoxazines
- Ring Synthesis 809

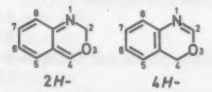
● 2,3-Benzoxazine



1*H*-

- 3,4,4a,5,8,8a-Hexahydro-1*H*-2,3-benzoxazines
- Ring Synthesis 631 (5273)

● 3,1-Benzoxazine



2*H*- 4*H*-

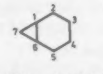
- 4*H*-3,1-Benzoxazines
- Ring Synthesis 378
- 1,2-Dihydro-4*H*-3,1-benzoxazines

see also: Isatoic Anhydrides

● Betaines derived from Cyclobutenediones
- Synthesis 656

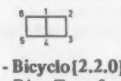
● Biaryls
- Synthesis 323 (5164), 537, 822, 922
- Functionally substituted Biphenyls
- Reactions 503

● Bicyclo[4.1.0]heptane



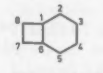
- Bicyclo[4.1.0]heptanes
- Ring Synthesis 735
- Bicyclo[4.1.0]-2,4-heptadienes
- Ring Synthesis 255

● Bicyclo[2.2.0]hexane



- Bicyclo[2.2.0]hexadienes (Dewar Benzenes)
- Ring Transformation 82

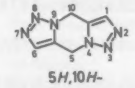
● Bicyclo[4.2.0]octane



- Bicyclo[4.2.0]octanes
- Synthesis 938 (5355)
- Bicyclo[4.2.0]-1^6-octene
- Ring Transformation 938 (5355)
- Bicyclo[4.2.0]-2,7-octadienes
- Ring Synthesis 247

● Bi-cyclopentadienyls
- Synthesis 472

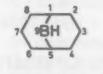
● Bis[1,2,3]triazolo[1,5-*a*;1′,5′-*d*]pyrazine



5*H*,10*H*-

- 1,5a,6,10a,Tetrahydro-5*H*,10*H*-bis[1,2,3]-triazolo[1,5-*a*;1′,5′-*d*]pyrazines
- Ring Synthesis 705

● 9-Borabicyclo[3.3.1]nonanes



- Ring Synthesis 845

● Boranates
- Synthesis 485 (5220)
- Reactions 485 (5220), 627 (5261) (5262)

● Boranes
- 1-Alkenylboranes
- Reactions 322 (5162)
- 4-Alkenylboranes
- Synthesis 712 (5294)
- 5-Alkenylboranes
- Synthesis 712 (5294)
- Alkylboranes Type R–BH_2
- Synthesis 146
- Alkyldibromoboranes
- Synthesis and Reactions 482 (5211)
- 1-Alkynylboranes
- Reactions 163 (5116), 554 (5247)
- Trialkylboranes
- Reactions 485 (5220), 676, 785 (5298)

● Boronic Acid Esters
- Synthesis 482 (5211)

● Bromochloro Compounds
- *vic*-Bromochloroalkanes
- Reactions 577

● *C*-Bromo Compounds
- Reactions 785 (5297) (5298)
- *gem*-Acyloxybromo Compounds
- Synthesis 593
- Arylbromomethanes
- Reactions 901
- Bromoalkanes
- Synthesis 707 (5279), 708 (5281), 771, 785 (5299)
- Reactions 72 (5090), 316, 326 (5175), 409 (5194), 410 (5197), 866 (5345)
- Bromoalkenes Type C=C–Br
- Synthesis 74 (5095), 159 (5104), 232 (5126), 290, 551, (5236) (5238), 625 (5256), 626 (5260)
- Reactions 290, 626 (5259), 631 (5274), 868 (5349)
- Bromoalkenes Type C=C–C–Br
- Synthesis 551 (5238)
- Reactions 162 (5115), 235 (5173), 708 (5282), 901
- 2-Bromoalkyl Ketones
- Synthesis 620
- Bromoalkynes Type C≡C–C–Br
- Reactions 578, 581
- Bromoallenes
- Synthesis 410 (5198)
- Bromoarenes
- Synthesis 406 (5185), 551 (5237), 693
- Reactions 410 (5197), 537
- α-Bromocarbonyl Compounds
- Synthesis 141, 231 (5125)
- Reactions 406 (5148)
- *C*-Bromo-*S*-heterocyclic Compounds
- Reactions 160 (5109)
- *vic*-Bromohydroxyalkanes
- Synthesis 605
- *gem*-Bromonitro Compounds
- Synthesis 550 (5235)
- *vic*-Dibromoalkanes
- Reactions 234 (5133), 311, 545
- *gem*-Dibromo Compounds
- Reactions 233 (5130), 901
- Hydrazonoyl Bromides
- Synthesis 382
- Polymer-Linked Bromoalkanes
- Synthesis and Reactions 315

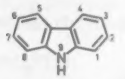
● Bromofluoro Compounds
- *vic*-Bromofluoroalkanes
- Synthesis and Reactions 217

● Carbamic Acid Azides
- Reactions 638

● Carbamic Acid Esters
- Alkyl Carbamates
- Synthesis 380, 632 (5277)
- *N*-Imidoylcarbamic Esters
- Synthesis 762

● Carbamimidic Halides
- Synthesis 38

● **Carbamimidothioic Acid Esters (Isothioureas)**
- Reactions 741
● **Carbazole**



- **1,2,3,4-Tetrahydrocarbazoles**
- Reactions with Retention of the Ring Skeleton 374
● **Carbenes**
- **Alkoxycarbenes**
- Reactions 83
- **Alkoxycarbonylcarbenes**
- Reactions 83
- **Cyclic Carbenes**
- Reactions 95
- **Dihalocarbenes**
- Reactions 16, 79, 320 (5155)
- **Halocarbenes**
- Reactions 16, 80, 81
● **Carbimidic Dihalides**
- Synthesis 376
- Reactions 38, 40
● **Carbimidochloridic Acid Esters**
- Synthesis 38
● **Carbodiimides**
- Synthesis 164 (5119)
- Reactions without Cyclization 928
● **Carbon Monoxide**
- Cyclotetramerization 873
● **Carbonochloridic Acid Esters**
- **Alkyl Carbonochloridates**
- Reactions 31
● **Carbonyl Cyanide (Mesoxalodinitrile)**
- Reactions 256
● **Carboperoxoic Acids**
- Reactions 679
● **Carboximidic Acid Esters**
- Reactions 559, 561
- ***N*-Arylcarboximidates**
- Synthesis and Cyclization Reactions 698
● **Carboximidic Acid Halides**
- **Arenecarboximidoyl Halides**
- Synthesis 38
- Reactions 894
- **Imidoyl Chlorides**
- Reactions 760, 781
● **Carboxylic Acid Amides**
- from Like Carbon Skeletons 863 (5334)
- Reactions without Cyclization 74 (5097), 238 (5145), 274, 554 (5246), 717
- ***N*-Acylimidazoles**
- Synthesis and Reactions 478
- **2,3-Alkadienamides**
- Synthesis 864 (5338)
- **Alkanamides**
- Synthesis 161 (5110), 546
- **2-Alkenamides**
- Synthesis 325 (5172)
- Reactions without Cyclization 546
- **4-Alkenamides**
- Synthesis 354
- ***N*-(1-Alkenyl)-carboxamides**
- Synthesis 490
- Review on Photochemical Reactions 489
- ***N*-(2-Alkenyl)-carboxamides**
- Synthesis 796
- ***N*-Alkylcarboxamides**
- Synthesis 74 (5097), 303, 474
- **Alkylformamides**
- Reactions without Cyclization 411 (5201)
- ***N*-(2-Alkynyl)-carboxamides**
- Synthesis 796
- **2-Aminoalkanamides**
- Synthesis 317
- ***C*-Aminocarbonyl-*N*-heterocyclic Compounds (*N*-Heterocyclic Carboxamides)**
- Synthesis 206, 374, 752
- ***N*-Substitution 37
- **2-Amino-2-mercaptoalkanamides and *S*-Derivatives**
- Synthesis and Reactions 865 (5340)
- **Arenecarboxamides**
- Synthesis 932
- Reactions without Cyclization 319 (5154)
- ***N*-Arylcarboxamides**
- Synthesis 474
- **Arylformamides**
- Cyclization Reactions 205
- Reactions without Cyclization 411 (5201)
- ***N*-Aryl(Heteroaryl)-2-alkenamides**
- Cyclization Reactions 506
- **2-Cyano-2,4-alkadienamides**
- Synthesis 172
- **2-Cyanoalkanamides**
- Reactions without Cyclization 673
- **2-Cyano-2-alkenamides**
- Synthesis 56, 264
- ***N,N*-Disubstituted Formamides**
- Synthesis 743
- Reactions 403
- **3-Hydroxy-4-alkenamides and *O*-Derivatives**
- Synthesis 621
- ***N*-(1-Hydroxyalkyl)-carboxamides**
- Reactions without Cyclization 74 (5097)
- **3-Mercapto-4-alkenamides and *S*-Derivatives**
- Synthesis 621
- **2-Oxoalkanamides and *O*-Derivatives**
- Synthesis 622, 857, 865 (5340)
- Reactions without Cyclization 857
- **3-Oxoalkanamides**
- Reactions without Cyclization 60
- **4-Oxoalkanamides**
- Synthesis 631 (5272)
● **Carboxylic Acid Anhydrides**
- Synthesis 587
- Reactions 792 (5317)
- **α-Aminocarboxylic Anhydrides**
- Synthesis 928
● **Carboxylic Acid Azides**
- Reactions 915
● **Carboxylic Acid Bromides**
- Synthesis 587
- Reactions 593
● **Carboxylic Acid Chlorides**
- Reactions 324 (5169), 587, 787 (5304), 925
- **Alkanoyl Chlorides**
- Reactions without Cyclization 593, 860 (5326)
- **2-Alkenoyl Chlorides**
- Cyclization Reactions 412 (5204)
- Reactions without Cyclization 143
- **Aryl Chlorides**
- Reactions without Cyclization 672, 714
- **2-Chloroalkanoyl Chlorides**
- Cyclization Reactions 448
- **Cycloalkanecarboxylic Acid Chlorides**
- Cyclization Reactions 111
● **Carboxylic Acid Esters**
- from Like Carbon Skeletons 587, 867 (5347)
- from Unlike Carbon Skeletons 239 (5147)
- Reactions 307, 863 (5334), 943 (5374)
- **2-Acyl-2-alkenoic Esters**
- Cyclization Reactions 272
- **2-Acyl-4-alkenoic Esters**
- Synthesis 581
- ***o*-Acylaminoarenecarboxylic Esters**
- Synthesis and Cyclization Reactions 619
- **3,7-Alkadienoic Esters**
- Synthesis 532
- **1,2-Alkadienyl Carboxylates**
- Synthesis 791 (5314)
- **Alkanoic Esters**
- Synthesis 161 (5110), 407 (5187), 411 (5200), 546, 720, 725, 792 (5318)
- Reactions without Cyclization 162 (5113), 236 (5140), 859 (5320), 937 (5354)
- **2,6,10-Alkatrienoic Esters**
- Reactions 605
- **2-Alkenoic Esters**
- Synthesis 67, 71 (5087), 162 (5113), 236 (5140), 485 (5220), 711 (5291), 717, 720, 725, 732, 859 (5320)
- Cyclization Reactions 52, 159 (5105)
- Cyclopropanation 83
- Reactions without Cyclization 328 (5180), 411 (5200), 546, 792 (5317)
- **3-Alkenoic Esters**
- Synthesis 234 (5134), 631 (5274), 864 (5337)
- **4-Alkenoic Esters**
- Synthesis 864 (5337)
- **5-Alkenoic Esters**
- Synthesis 864 (5337)
- **6-Alkenoic Esters**
- Synthesis 864 (5337)
- **10-Alkenoic Esters**
- Reactions without Cyclization 468
- **11-Alkenoic Esters**
- Synthesis 864 (5337)
- **1-Alkenyl Carboxylates**
- Cyclization Reactions 486 (5221)
- **2-Alkenyl Carboxylates**
- Reactions without Cyclization 552 (5240), 942 (5371)
- **2-Alkynoic Esters**
- Cyclization Reactions 938 (5355)
- Reactions without Cyclization 71 (5087), 161 (5111), 860 (5325)
- **2-Alkynyl Carboxylates**
- Reactions without Cyclization 791 (5314)
- **2-Aminoalkanoic Esters**
- Cyclization Reactions 621
- **3-Aminoalkanoic Esters**
- Synthesis 487 (5226)
- **2-Amino-2-alkenoic Esters**
- Synthesis 76 (5102), 240 (5152)
- **2-Amino-3-alkenoic Esters**
- Synthesis 328 (5180)
- **2-Aminomethyl-2-alkenoic Esters**
- Synthesis and Cyclization Reactions 539
- **3-Arylalkanoic Esters**
- Synthesis 590, 937 (5354)
- **1-Benzothiophenecarboxylic Esters**
- Synthesis 59
- **Cyanoacetic Esters**
- Reactions without Cyclization 392
- **2-Cyanoalkanoic Esters**
- Synthesis 486 (5222)
- **ω-Cyanoalkanoic Esters**
- Synthesis 326 (5173)
- **2-Cyano-2-alkenoic Esters**
- Synthesis 56, 74 (5096)
- Cyclization Reactions 681
- Reactions without Cyclization 486 (5222)
- **2-Cyano-3-halo-2-alkenoic Esters**
- Reactions without Cyclization 74 (5096)
- **Cyclohexadienecarboxylic Esters**
- Synthesis 631 (5273)
- **Diacylacetic Esters and *O*-Derivatives**
- Synthesis and Reactions 829
- **3,3-Dialkoxyalkanoic Esters**
- Synthesis 161 (5111)
- **3,4-Dihalo-2-alkenoic Esters**
- Reactions without Cyclization 410 (5198)
- **Dihalocyanoacetic Esters**
- Cyclization Reactions 41
- **2,4-Dioxoalkanoic Esters**
- Cyclization Reactions 162 (5113)
- **4,7-Dioxoalkanoic Esters**
- Synthesis 942 (5370)
- **5,8-Dioxoalkanoic Esters**
- Synthesis 942 (5370)
- **9,12-Dioxoalkanoic Esters**
- Synthesis 942 (5370)
- **2,3-Epoxyalkanoic Esters**
- Synthesis 944 (5376)
- **4-Halo-2,3-alkadienoic Esters**

- Synthesis 410 (5198)
- **2-Haloalkanoic Esters**
- Synthesis 407 (5187)
- Cyclization Reactions 59, 556 (5253)
- Reactions without Cyclization 407 (5187), 645
- **2-Halo-2-alkenoic Esters**
- Synthesis 31
- **3-Halo-2-alkenoic Esters**
- Reactions without Cyclization 485 (5220)
- **2-Halo-4-alkenoic Esters**
- Reactions without Cyclization 407 (5187)
- **4-Halo-2-alkenoic Esters**
- Cyclization Reactions 531
- **2-Haloalkyl Carboxylates**
- Synthesis 553 (5243)
- Reactions without Cyclization 483 (5214)
- **2-Halo-3-oxoalkanoic Esters**
- Reactions without Cyclization 604
- **3-Hydrazonoalkanoic Esters**
- Reactions without Cyclization 234 (5134)
- **5-Hydroxy-2,4-alkadienoic Esters and *O*-Derivatives**
- Synthesis 860 (5325)
- **2-Hydroxyalkanoic Esters and *O*-Derivatives**
- Synthesis 233 (5131), 716
- **3-Hydroxyalkanoic Esters and *O*-Derivatives**
- Synthesis 163 (5117), 400
- Cyclization Reactions 944 (5376)
- **10-Hydroxyalkanoic Esters**
- Synthesis 468
- **3-Hydroxy-2-alkenoic Esters and *O*-Derivatives**
- Reactions without Cyclization 620
- **3-Hydroxy-4-alkenoic Esters and *O*-Derivatives**
- Synthesis 401
- **2-Hydroxy-4-oxoalkanoic Esters and *O*-Derivatives**
- Synthesis 237 (5141)
- **Imidazolecarboxylic Esters**
- Synthesis 741
- **2-Iminoalkanoic Esters**
- Reactions without Cyclization 712 (5295)
- **2-Isocyano-2-alkenoic Esters**
- Synthesis 840
- **2-Isocyano-3-alkenoic Esters**
- Synthesis 840
- **2-Mercaptoalkanoic Esters and *S*-Derivatives**
- Synthesis 720
- Reactions without Cyclization 711 (5291)
- **2-Mercapto-2-alkenoic Esters and *S*-Derivatives**
- Reactions without Cyclization 620
- **2-Nitro-2-alkenoic Esters**
- Synthesis 328 (5180)
- **5-, 6-, 7-, 8-.....Oximinoalkanoic Esters**
- Synthesis 326 (5174), 410 (5199)
- **2-Oxoalkanoic Esters**
- Synthesis 865 (5339)
- Cyclization Reactions 791 (5315)
- Reactions without Cyclization 233 (5131), 237 (5141)
- **3-Oxoalkanoic Esters and *O*-Derivatives**
- Synthesis 161 (5111), 725, 829
- Cyclization Reactions 183, 292, 449, 581, 591
- Reactions without Cyclization 60, 581, 829, 864 (5336)
- **4-Oxoalkanoic Esters**
- Synthesis 631 (5272), 792 (5317), 863 (5335)
- **9-Oxoalkanoic Esters**
- Synthesis 468
- **3-Oxo-4-alkenoic Esters**
- Synthesis 143
- **4-Oxo-2-alkenoic Esters**
- Synthesis 725
- **3-Oxo-1-alkenyl Carboxylates**
- Reactions 925
- **6-Oxocyclohexene-3-acetic Esters**
- Synthesis 364
- **2-Oxo-3-phosphonoalkanoic Esters**
- Synthesis 37
- **2-Sulfinylalkanoic Esters**
- Reactions without Cyclization 163 (5117)
- **2,2,3-Trihydroxyalkanoic Esters and *C*-Derivatives**
- Synthesis 790 (5313)
- **2-Ureidoalkanoic Esters**
- Synthesis 915
- ● **Carboxylic Acid Hydrazides**
- Synthesis 622
- Cyclization Reactions 812
- ● **Carboxylic Acids**
- from Like Carbon Skeletons 942 (5371)
- from Unlike Carbon Skeletons 462
- Reactions 411 (5203), 474, 862 (5330), 867 (5347), 929, 941 (5366)
- **Acetic Acid**
- Reactions 402
- **α-Acylamino-α-alkyl(aryl) thio-acetic Acids**
- Synthesis 53
- **Acylaminohaloacetic Acids**
- Synthesis and Reactions 53
- **α-Acylamino-α-hydroxyacetic Acids and *O*-Derivatives**
- Synthesis 53
- **α-Acylamino-α-sulfonylacetic Acids**
- Synthesis 53
- **2,6-Alkadienoic Acids**
- Synthesis 553 (5244)
- **Alkanoic Acids**
- Synthesis 161 (5110), 325 (5171), 343, 546, 733
- Reactions without Cyclization 429, 766
- **2-Alkenoic Acids**
- Synthesis 56, 131, 133, 312, 725
- Reactions without Cyclization 343, 368, 546
- **3-Alkenoic Acids**
- Synthesis 325 (5171)
- **9-Alkenoic Acids**
- Synthesis 468
- **2-Aminoalkanoic Acids**

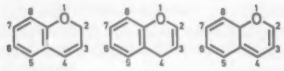
see also: Amino Acids and Derivatives

- Synthesis 712 (5295)
- **4-Aminoalkanoic Acids**
- Cyclization Reactions 614
- **5-Aminoalkanoic Acids**
- Cyclization Reactions 614
- **2-Amino-2-alkenoic Acids**
- Synthesis 76 (5102)
- **2-Amino-3-alkenoic Acids**
- Synthesis 840
- ***o*-Aminoarenecarboxylic Acids**
- Cyclization Reactions 635
- **4-Amino-3-hydroxyalkanoic Acids**
- Cyclization Reactions 614
- **Arenecarboxylic Acids**
- Synthesis 933
- **Arylacetic Acids**
- Synthesis 66
- **2-Cyanoalkanoic Acids**
- Reactions without Cyclization 445
- **2-Cyano-2-alkenoic Acids**
- Synthesis 56
- **Cycloalkenecarboxylic Acids**
- Cyclization Reactions 328 (5179), 792 (5319)
- **3,4-Dialkoxycarbonyl-3-alkenoic Acids**
- Synthesis 791 (5315)
- **2,2-Diaryloxyalkanoic Acids**
- Synthesis 828
- ***o*-Formylarenecarboxylic Acids**
- Cyclization Reactions 159 (5106)
- **2-Hydroxyalkanoic Acids and *O*-Derivatives**
- Synthesis 325 (5172), 348, 405 (5182), 828
- **3-Hydroxyalkanoic Acids and *O*-Derivatives**
- Synthesis 163 (5117)
- **11-, 12-, 13-Hydroxyalkanoic Acids**
- Synthesis 412 (5205)
- **2-Hydroxy-2-alkenoic Acids and *O*-Derivatives**
- Synthesis 791 (5316)
- **3-Hydroxy-4-alkenoic Acids and *O*-Derivatives**
- Synthesis 552 (5240)
- **Indolecarboxylic Acids**
- Synthesis 374
- **2-Mercaptoalkanoic Acids and *S*-Derivatives**
- Reactions without Cyclization 369
- **3-Mercaptoalkanoic Acids and *S*-Derivatives**
- Synthesis and Cyclization Reaction 368
- **2-Methylene-4-alkenoic Acids**
- Synthesis 476
- **2-Oxoalkanoic Acids**
- Reactions without Cyclization 405 (5182), 622
- **4-Oxoalkanoic Acids**
- Synthesis 75 (5099), 631 (5272)
- **9-Oxoalkanoic Acids**
- Synthesis 468
- **6-Oxocyclohexene-3-acetic Acids**
- Synthesis 364
- **2-Selenylalkanoic Acids and *Se*-Derivatives**
- Synthesis and Reactions 476
- **4-Selenylalkanoic Acids and *Se*-Derivatives**
- Synthesis 864 (5337), 942 (5369)
- Reactions 864 (5337)
- **5-Selenylalkanoic Acids and *Se*-Derivatives**
- Synthesis 864 (5337), 942 (5369)
- Reactions 864 (5337)
- **6-Selenylalkanoic Acids and *Se*-Derivatives**
- Synthesis 864 (5337), 942 (5369)
- Reactions 864 (5337)
- **7-Selenylalkanoic Acids and *Se*-Derivatives**
- Synthesis and Reactions 864 (5337)
- **2-Sulfinylalkanoic Acids**
- Reactions 163 (5117)
- ● **Cephams, Cephalosporins, and Relatives**

Cepham

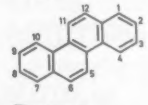
- Reactions 261
- ● ***C*-Chloro Compounds**
- Reactions 785 (5297) (5298)
- ***gem*-Acyloxychloroalkanes**
- Synthesis 593
- ***vic*-Acyloxychloroalkanes**
- Synthesis 553 (5243)
- **Chloroalkanes**
- Synthesis 238 (5144), 407 (5188), 707 (5279), 708 (5281), 714, 785 (5299)
- Reactions 72 (5090), 326 (5175), 866 (5345)
- **Chloroalkenes Type C=C–Cl**
- Synthesis 74 (5095), 159 (5104), 625 (5256)
- Reactions 73 (5094), 631 (5274), 868 (5349)
- **Chloroalkenes Type C=C–C–Cl**
- Synthesis 371, 481 (5208)
- Reactions 73 (5092), 162 (5115), 235 (5137), 408 (5190), 547, 705, 708 (5282)
- **Chloroalkynes Type C≡C–C–Cl**
- Reactions 86
- **Chloroallenes**
- Synthesis 410 (5198)
- **Chloroarenes**
- Synthesis 406 (5185)
- Reactions 127, 537
- **α-Chlorocarbonyl Compounds**
- Synthesis 233 (5129)
- ***C*-Chloro-*N*-heterocyclic Compounds**
- Synthesis 38, 40, 380, 855

- Reactions 380
- *C*-Chloro-*S*-heterocyclic Compounds
- Synthesis and Reactions 327 (5176)
- Chloromethylarenes
- Synthesis 376, 435
- Reactions 612
- *gem*-Chloronitro Compounds
- Synthesis 550 (5235)
- *vic*-Dichloroalkanes
- Synthesis 707 (5278)
- 1,4-Dichloro-2-alkynes
- Reactions 359
- Dichloromethylarenes
- Synthesis 376
- Polychloro-*N*-heterocyclic Compounds
- Synthesis 40
- 1,1,1-Trichloro Compounds
- Reactions 38
- Trichloromethylarenes
- Synthesis 376
- Reactions 901
- α,β-Unsaturated α-Chlorocarbonyl Compounds
- Synthesis 458
- *N*-Chloro Compounds
- Synthesis and Reactions 240 (5152)
- Chlorofluoro Compounds
- 2-Chloro-3-fluoro-2-alkenols
- Synthesis and Reactions 458
- *gem*-Chlorofluorocyclopropanes
- Synthesis 320 (5155)
- 1,1-Dichloro-2,2-difluoroethylene
- Reactions 458
- Chromene

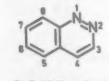


see also: Chromones, Coumarins, Flavones, Isoflavones
- 2*H*-Chromenes
- Ring Synthesis 888
- 4-Alkylidenechromenes
- Anellation Reactions 244
- Chromylium Salts
- Anellation Reactions 244
- Chromans
- Ring Synthesis 888
- Chromanones
- Ring Synthesis 886, 888
- 5,6,7,8-Tetrahydro-4*H*-chromenes
- Ring Synthesis 190
- Chromones

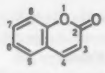
- from Like Ring Skeletons 208
- Anellation Reactions 691, 779
- Chrysene



- Chrysenes
- Ring Synthesis 774
- 1,2,3,4,4a,4b,5,6,10b,11,12,12a-Dodecahydrochrysenes
- Ring Synthesis 800
- Cinnoline



- 2,8-Dihydrocinnolines
- Ring Synthesis 185
- Coumarins



- from Like Ring Skeletons 145
- Ring Synthesis 179
- Reactions with Retention of the Ring Skeleton 208
- Croconic Acid and Derivatives

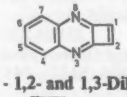
- Reactions 194, 281
- Crown Ethers
- Synthesis 223, 688
- Cumulenes
- Reactions 79
- Cyanamides
- Synthesis and Reactions 673, 882
- Cyanates
- Aryl Cyanates
- Reactions without Cyclization 40
- Cyanogen Halides
- Reactions 40, 166
- Cyanohydrins

see: Nitriles (2-Hydroxyalkanenitriles and *O*-Derivatives)
- Cyanothioureas
- Synthesis and Reactions 776
- Cycloalkanones and Derivatives
- Anellation Reactions 228
- Reactions with Retention of the Ring Skeleton 228
- Ring Cleavage 326 (5173) (5174)
- Cycloalkenes
- from Like Ring Skeletons 234 (5134)
- Ring Synthesis 405 (5183)
- Cyclobutabenzene

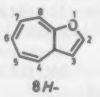
- 1,2-Dihydrocyclobutabenzenes
- Ring Cleavage 794
- Ring Transformation 795
- Benzocyclobutenediones and Derivatives
- Synthesis and Reactions 875
- Hydrogenated Derivatives

see: Bicyclo[4.2.0]octane
- Cyclobuta[*a*]naphthalene

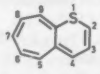
- 1,2,2a,8b-Tetrahydrocyclobuta[*a*]naphthalenes
- Ring Synthesis and Cleavage 589
- Cyclobutanes
- Ring Synthesis 237 (5143)
- Cyclobutanediones and Derivatives
- Ring Synthesis 111
- Ring Transformation 86
- Cyclobutanones and Derivatives
- Ring Synthesis 237 (5143), 481 (5209), 728, 821
- Ring Cleavage 481 (5209)
- Functionally Substituted Cyclobutanes
- from Like Ring Skeletons 72 (5089)
- Ring Synthesis 8, 110, 250, 255, 486 (5221), 870
- Spiro-Substituted Cyclobutanes
- Ring Synthesis 68, 80, 110, 187
- Cyclobuta[*b*]quinoxaline



- 1,2- and 1,3-Dihydrocyclobuta[*b*]quinoxalines
- Ring Synthesis 664
- Cyclobutenes
- Cyclobutenediones and Derivatives
- Synthesis 1–22, 250, 831, 872
- Reactions with Retention of the Ring Skeleton 1, 194, 649, 831
- Ring Cleavage 663
- Ring Transformation 660, 664
- Cyclobutenones and Derivatives
- Synthesis 657, 871
- Reactions 871, 872
- Functionally Substituted Cyclobutenes
- Synthesis 3–15, 79, 82, 237 (5143)
- Reactions with Retention of the Ring Skeleton 72 (5089), 85
- Ring Cleavage 863 (5335)
- Ring Transformation 255
- 1,5,9-Cyclododecatrienes
- Ring Cleavage 240 (5151)
- Cyclohepta[*b*]furan

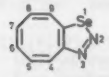


- Ring Synthesis 245
- Cycloheptanes
- Cycloheptanones and Derivatives
- Ring Synthesis 93
- Cyclohepta[*b*]thiapyran

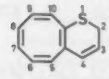


- 2,3,4,5,6,7,8,9-Octahydrocyclohepta[*b*]thiapyrans
- Ring Synthesis and Transformation 228
- Cycloheptatrienes
- Cycloheptatrienones (Tropones)
- Anellation Reactions 245, 246
- Reactions with Retention of the Ring Skeleton 245
- Functionally Substituted Cycloheptatrienes
- from Like Ring Skeletons 247
- Spiro-Substituted Cycloheptatrienes
- Ring Synthesis 83
- Cycloheptenes
- from Like Ring Skeletons 481 (5207)
- Cyclohexadienes
- 1,4-Cyclohexadienes
- from Like Ring Skeletons 631 (5272)
- Ring Synthesis 159 (5105)
- Reactions with Retention of the Ring Skeleton 709 (5286)
- Cyclohexadienones and Derivatives
- from Like Ring Skeletons 86
- Cyclohexanes
- 1,3-Cyclohexanediones and Derivatives
- from Like Ring Skeletons 709 (5286)
- Anellation Reactions 256
- Reactions with Retention of the Ring Skeleton 183
- Cyclohexane Hydrocarbons
- Reactions with Retention of the Ring Skeleton 760
- Cyclohexanones and Derivatives
- Ring Synthesis 272
- Reactions with Retention of the Ring Skeleton 406 (5186)
- Ring Transformation 93, 96
- Functionally Substituted Cyclohexanes
- Ring Synthesis 272, 861 (5327)
- Anellation Reactions 786 (5300)
- Cyclohexenes
- Cyclohexenones and Derivatives
- from Like Ring Skeletons 406 (5186), 550 (5234)
- Ring Synthesis 712 (5296)
- Anellation Reactions 43, 938 (5355)
- Reactions with Retention of the Ring Skeleton 179, 364

- **Functionally Substituted Cyclohexenes**
- Ring Synthesis 159 (5105), 189, 628
- **Cyclonucleosides**
- Synthesis and Reactions 908
- **1,5-Cyclooctadienes**
- Ring Cleavage 240 (5151)
- Transannular Reactions 845
- **Cyclooctanes**
- **Cyclooctanones and Derivatives**
- from Like Ring Skeletons 597
- **Cycloocta-1,2,3-selenadiazole**

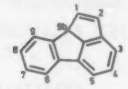


- **4,5,6,7,8,9-Hexahydrocycloocta-1,2,3-selenadiazoles**
- Ring Synthesis and Cleavage 597
- **Cycloocta[*b*]thiapyran**



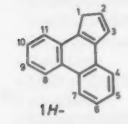
2*H*-

- **3,4,5,6,7,8,9,10-Octahydro-2*H*-cycloocta[*b*]thiapyrans**
- Ring Synthesis and Transformation 228
- **Cyclooctatrienes**
- Ring Transformation 247
- **Cyclooctenes**
- **Cyclooctene Hydrocarbons**
- Reactions with Retention of the Ring Skeleton 290
- **Cyclooctenones and Derivatives**
- Transannular Reactions 861 (5327)
- **Cyclooctynes**
- Synthesis 290, 536, 597
- Ring Transformation 90
- **Cyclopentadienide Salts**
- Reactions 472
- **Cyclopenta[*jk*]fluorene**



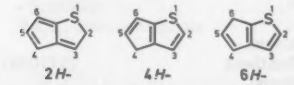
9b*H*-

- Ring Synthesis 595
- **Cyclopentanes**
- **Cyclopentanediones and Derivatives**
- Ring Cleavage 75 (5099)
- **Cyclopentanetriones and Derivatives**
- Ring Synthesis 468
- **Cyclopentanones and Derivatives**
- from Like Ring Skeletons 408 (5191)
- Ring Synthesis 728
- **Functionally Substituted Cyclopentanes**
- from Like Ring Skeletons 150
- Ring Synthesis 861 (5327), 885
- **Cyclopenta[*l*]phenanthrene**



1*H*-

- Ring Synthesis 595
- **Cyclopenta[*b*]thiophene**



2*H*- 4*H*- 6*H*-

- **4*H*-Cyclopenta[*b*]thiophenes**
- Ring Synthesis 264
- **5,6-Dihydro-4*H*-cyclopenta[*b*]thiophenes**
- Ring Synthesis 264
- **Cyclopentenes**
- **Cyclopentenones and Derivatives**
- Ring Synthesis 160 (5107), 221, 322 (5163), 721, 786 (5301), 939 (5360)
- Dimerization 543
- Reactions with Retention of the Ring Skeleton 408 (5191)
- **Functionally Substituted Cyclopentenes**
- from Like Ring Skeletons 72 (5089)
- Ring Synthesis 150, 628 (5266), 728
- **Cyclopropanes**
- Ring Synthesis 345
- **Cyclopropane Hydrocarbons**
- Ring Synthesis 579, 627 (5262), 939 (5359)
- **Cyclopropylcarbocycles**
- Synthesis 71 (5087)
- **Functionally Substituted Cyclopropanes**
- from Like Ring Skeletons 71 (5087)
- Ring Synthesis 46, 79, 255, 256, 275, 304, 320 (5155), 481 (5207) (5209), 530, 733, 838, 885, 943 (5373)
- Ring Cleavage 227, 320 (5155), 532, 556 (5254)
- Ring Transformation 237 (5143), 821
- **Spiro-Substituted Cyclopropanes**
- Ring Synthesis 79, 728
- **Cyclopropa[*c*]pyridine**

1*H*-

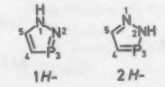
- **1a,2,3,5a-Tetrahydro-1*H*-cyclopropa[*c*]pyridines**
- Ring Synthesis 664
- **Cyclopropenes**
- **Cyclopropene Hydrocarbons**
- Ring Transformation 207
- **Cyclopropenium Betaines and Salts**
- Synthesis 197
- **Cyclopropenones and Derivatives**
- Ring Transformation 273
- **Functionally Substituted Cyclopropenes**
- Reactions with Retention of the Ring Skeleton 197
- Ring Transformation 16, 17

- **Deuterio Compounds**
- ***B*-Deuterio Compounds**
- Synthesis 845
- ***C*-Deuterio Compounds**
- Synthesis by Reduction Reactions using Deuterium or Deuterium Derivatives 285
- **Dewar Benzenes**

see: Bicyclo[2.2.0]hexadienes

- **Dialdehydes**
- Cyclization Reactions 210, 405 (5183)
- **Aromatic 1,3-Dicarboxaldehydes**
- Reactions without Cyclization 58
- ***o,o'*-Diformyloxalanilides**
- Cyclization Reactions 680
- **Diamines**
- ***vic*-Diaminoalkanes**
- Synthesis 859 (5321), 914
- ***o*-Diaminoarenes and Hetero Analogs**
- Cyclization 373, 438, 451, 680
- **Enediamines**
- Synthesis 894
- **Dioxaalkanediamines**
- Synthesis and Cyclization Reactions 223
- **Diazaphosphirene**

- **Diazaphosphiranes**
- Ring Synthesis 564
- **1,2,3-Diazaphosphole**



1*H*- 2*H*-

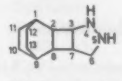
- **2*H*-1,2,3-Diazaphospholes**
- Ring Synthesis 557
- **3,4-Dihydro-2*H*-1,2,3-diazaphospholes**
- Ring Synthesis 560, 565
- Reactions with Retention of the Ring Skeleton 560
- **1,4,2-Diazaphosphole**

1*H*- 2*H*-

- **2,3-Dihydro-P^V-1,4,2-diazaphospholes**
- Ring Synthesis 526
- **[1,3,2]Diazaphospholo[2,1-*b*][1,3,4,2]oxadiazaphosphorin**

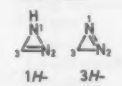
4*H*,8*H*-

- **Tetrahydro[1,3,2]diazaphospholo[2,1-*b*][1,3,4,2]oxadiazaphosphorins**
- Ring Synthesis 569
- **4,5-Diazatetracyclo[7.2.2.$0^{2,8}$.$0^{3,7}$]tridecane**



- **4,5-Azaazoniatetracyclo[7.2.2.$0^{2,8}$.$0^{3,7}$]trideca-4,10-dienes**
- Ring Synthesis 384
- **1,7-Diazatricyclo[5.2.1.$0^{4,10}$]decane**

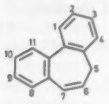
- **1,7-Diazatricyclo[5.2.1.$0^{4,10}$]2,5-decadienes**
- Ring Synthesis 254
- **Diazenes (Azo Compounds)**
- ***N*-Acyl-*N'*-aryldiazenes**
- Cyclization Reactions 576
- **1-Alkenyldiazenes**
- Cyclization Reactions 565
- **Alkyltrifluoromethyldiazenes**
- Synthesis and Reactions 937 (5352)
- ***C*-Azo-*P*-heterocyclic Compounds**
- Synthesis 846
- **Diazenedicarboxylic Esters**
- Cyclization Reactions 485 (5219)
- **Diazirine**



1*H*- 3*H*-

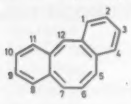
- Ring Transformation 96
- Use as C-Synthon 16
- **Diazo Compounds**
- Reactions 345
- **Cyclic Diazo Compounds**
- Reactions 95
- **Diaryldiazomethanes**
- Synthesis 481 (5207)
- **Diazoalkanes**
- Reactions 91, 92, 95, 384, 739, 860 (5326)
- **α-Diazocarboxylic Acid Derivatives**
- Synthesis 535
- Reactions 94
- **Diazocyclopentadienes**
- Reactions 97, 595
- **Diazo-*N*-heterocyclic Compounds**
- Synthesis 535
- **Diazo-*S*-heterocyclic Compounds**
- Synthesis 535
- **α-Diazoketones**
- Synthesis 535, 860 (5326)

- Reactions 630 (5270), 813, 860 (5326)
● Diazonium Salts
- Reactions 445, 551 (5237), 604, 635, 846
● Dibenzo[*a,c*]cycloheptene

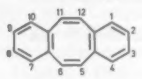


5*H*-

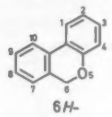
- 6,7-Dihydro-5*H*-dibenzo[*a,c*]cycloheptenes
- Ring Synthesis 323 (5164)
● Dibenzo[*a,d*]cyclooctene



- 5,6,7,12-Tetrahydrodibenzo[*a,d*]cyclooctenes
- Ring Synthesis 274
● Dibenzo[*a,e*]cyclooctene

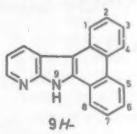


- 5,6-Dihydro-10,11-didehydrodibenzo[*a,e*]cyclooctenes
- Ring Synthesis 536
● Dibenzo[*b,d*]pyran



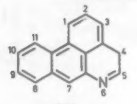
6*H*-

- Ring Synthesis 503
● Dibenzo[*g,i*]pyrido[2,3-*b*]indole



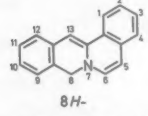
9*H*-

- Ring Synthesis 203
● Dibenzo[*de,g*]quinoline



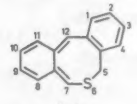
4*H*-

- 7*H*-Dibenzo[*de,g*]quinolines
- Ring Synthesis 502
- 5,6-Dihydro-4*H*-dibenzo[*de,g*]quinolines
- Ring Synthesis 500
● Dibenzo[*a,g*]quinolizine



8*H*-

- 5,6-Dihydro-8*H*-dibenzo[*a,g*]quinolizines
- Ring Synthesis 503, 509
- 5,6-13,13a-Tetrahydro-8*H*-dibenzo[*a,g*]-quinolizines
- Ring Synthesis 509
● Dibenzo[*c,f*]thiocin



5*H*-

- 7,12-Dihydro-5*H*-dibenzo[*c,f*]thiocins
- Ring Synthesis 214
● Dicarbonic Acid Esters
- Reactions 380
● Dicarboxylic Acid Anhydrides and S-Analogs
- Reactions 488 (5228)
- Cyclohexane-1,2-dicarboxylic Anhydrides
- Reactions 461
- Cyclohexene-4,5-dicarboxylic Anhydrides
- Synthesis 482 (5212)
- Reactions 631 (5273)
- Maleic Anhydrides
- Reactions 461, 482 (5212)
- Phthalic Anhydrides
- Reactions 461
- Pyridine-2,3-dicarboxylic Anhydrides
- Reactions 461
● Dicarboxylic Acid Chlorides
- Dioxaalkanedioyl Dichlorides
- Synthesis and Cyclization Reactions 223
- Oxalyl Chloride
- Cyclization Reactions 622
● Dicarboxylic Acid Esters
see also: Malonic Acid Esters
- Acetylenedicarboxylic Esters
- Cyclization Reactions 52, 116, 159 (5105), 938 (5355)
- Cyclopropenation 99
- Arene-*o*-dicarboxylic Esters
- Synthesis 52
- Butanedioic Esters
- Cyclization Reactions 791 (5315)
- Cycloaliphatic 1,1-Dicarboxylic Esters
- Synthesis 150
- Oxalic Esters
- Reactions without Cyclization 162 (5113)
- Oxobutanedioic Esters
- Synthesis and Cyclization Reactions 162 (5113)
- 2-Oxopentanedioic Esters
- Synthesis 718
● Dicarboxylic Acids
- Acetylenedicarboxylic Acid
- Cyclization Reactions 482 (5212)
- Alkanedioic Acids
- Synthesis 629 (5267)
- 2-Aminopentanedioic Acids
- Cyclization Reactions 614, 685, 752
- Dioxaalkanedioic Acids
- Synthesis 223
● Dicyanamides
- Reactions 776
● Dienes (conjugated)
- Synthesis 549 (5231)
- Cyclization Reactions 482 (5212)
- *vic*-Bis-exomethylene Compounds
- Synthesis and Cyclization Reactions 52
- Diene Hydrocarbons
- Synthesis 860 (5324)
- Cyclization Reactions 107, 115, 189
- Reactions without Cyclization 345
- Functionally Substituted Dienes
- Synthesis 418
- Cyclization Reactions 159 (5105)
● Diketene
- Reactions 553 (5244), 685
● Diketones
- Cyclization Reactions 405 (5183)
- 2-Alkene-1,4-diones
- Cyclization Reactions 107
- Cyclic 1,2-Diketones
- Synthesis 629 (5267)
- Cyclization Reactions 201
- Cyclic 1,3-Diketones
- Synthesis 709 (5286)
- Reactions 75 (5099), 925
- Cyclic 1,4-Diketones
- Reactions 242
- 1,3-Cyclobutanediones
- Synthesis 111
- Cyclobutenediones
- Synthesis 1, 250, 869
- Reactions 1, 194, 649, 831
- *vic*-Diketones
- Synthesis 462, 555 (5249), 723, 867 (5346)
- Cyclization Reactions 180
- 1,3-Diketones
- Synthesis 324 (5167)
- Cyclization Reactions 182, 322 (5163), 591
- Reactions without Cyclization 22
- 1,4-Diketones
- Synthesis 221, 232 (5128), 324 (5168), 406 (5184), 485 (5218), 627 (5261), 718, 732, 866 (5344)
- Cyclization Reactions 181, 221
- 1,5-Diketones
- Reactions without Cyclization 192
- 2-Halo-1,3-diketones
- Reactions without Cyclization 604
● Dinitriles
see also: Malodinitriles
- Synthesis 155, 238 (5145)
- Reactions 155
- Butanedinitriles
- Synthesis 392
- Cycloaliphatic *vic*-Dinitriles
- Synthesis 72 (5089)
- Diaminomaleodinitriles
- Cyclization Reactions 373
- Dimercaptomaleodinitrile
- Cyclization Reactions 816
- *N*-Heterocyclic Dinitriles
- Synthesis 373
● Diols (including *O*-Protected Derivatives)
- Cyclization Reactions 75 (5098)
- 2-Alkene-1,8-diols
- Synthesis 417
- *vic*-Diols
- Synthesis 862 (5330)
- Cyclization Reactions 814, 826
- Reactions without Cyclization 358
- 1,3-Diols
- Synthesis 627 (5262), 862 (5330)
- Cyclization Reactions 295
- 1,4-Diols
- Synthesis 627 (5261)
● 6,8-Dioxabicyclo[3.2.1]octane

- Ring Synthesis 422
● 1,2-Dioxepin

- 1,2-Dioxepanes
- Ring Synthesis 75 (5098)
● 1,2-Dioxetane

- Ring Synthesis 68
● 1,2-Dioxin

- 1,2-Dioxans
- Ring Synthesis 75 (5098)
● 1,3-Dioxin

- 1,3-Dioxans
- Ring Synthesis 295

- Ring Transformation 386
● 1,2-Dioxocin

- 1,2-Dioxocans
- Ring Synthesis 75 (5098)
● 1,2-Dioxole

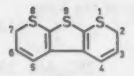
- 1,2-Dioxolanes
- Ring Synthesis 75 (5098)
● 1,3-Dioxole

- 1,3-Dioxoles
- Anellation Reactions 3, 119
- 1,3-Dioxolanes
- Ring Synthesis 719, 814
- Ring Cleavage 815
- Reactions with Retention of the Ring Skeleton 555 (5249)
● Diphenol Derivatives
- Catechol Ethers
- Synthesis and Reactions 223
● Diphenols
- Hydroquinones
- Anellation Reactions 66
- Resorcines
- Synthesis 712 (5296)
● Diphosphoric Acid Esters
- Reactions 519
● Disaccharides and Derivatives
- 2'-Deoxy-2'-halodisaccharides
- Synthesis 696
● Diselenides
- Reactions 418
● 1,3-Diselenin

- 1,3-Diselenanes
- Ring Synthesis 261
● 1,3-Diselenole

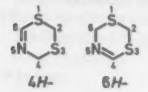
- 1,3-Diselenolanes
- Ring Synthesis 261
● Disilazanes
- Reactions 810
● Disulfides
- Synthesis 50, 670, 719
- Reactions 729
- Alkoxycarbonyl Disulfides
- Synthesis and Reactions 782
- Bis[*o*-aminoaryl] Disulfides
- Reactions 438
- Dialkyl Disulfides
- Reactions 360
- Diaryl Disulfides
- Reactions 360, 720
- Dihalomethyl Disulfides
- Synthesis 816
● 1,3,2-Dithiaphosphole

- Ring Synthesis 667
● Dithiapyrano[2,3-*b*;3',2'-*d*]thiophene



2*H*,7*H*-

- Ring Synthesis 578
● 1,3,5-Dithiazine



4*H*- 6*H*-

- Ring Synthesis 443
● 1,2,4-Dithiazole

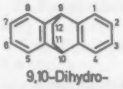
- Dihydro-1,2,4-dithiazoles
- Ring Synthesis and Cleavage 625 (5257)
● 1,3-Dithiin

- 1,3-Dithians
- Ring Synthesis 239 (5149), 261, 826
- Reactions with Retention of the Ring Skeleton 310, 327 (5176), 629 (5268)
● Dithiobiurets
- Synthesis 776
● Dithiocarbamic Acid Esters
- Synthesis 164 (5121)
- Reactions 164 (5121), 370, 717
● Dithiocarbamic Acids
- Reactions 164 (5121), 239 (5148)
● Dithiocarbonic Acid Esters
- *O,O'*-Alkanediyl *S,S'*-Dialkyl Bis-dithiocarbonates
- Synthesis and Reactions 286
- *O*-Alkyl Dithiocarbonate Salts
- Reactions 366
- *O,S*-Diesters
- Synthesis 366, 814
- Reactions 717
● Dithiocarboxylic Acid Esters
- Synthesis 715
- 1-Alkenyl Dithiocarboxylates
- Synthesis and Reactions 439
- 1,1-Dithiooxalic Esters
- Synthesis 849
● Dithiocarboxylic Acids
- 4-Alkenedithioic Acids
- Synthesis and Cyclization Reactions 439
- Arenedithiocarboxylic Acids
- Reactions 716
● Dithiolactones
- Synthesis 439
● 1,2-Dithiole

- 1,2-Dithioles
see: Trithiones
- 1,2-Dithiolium Salts
- from Like Ring Skeletons 815, 816
● 1,3-Dithiole

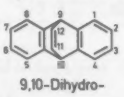
- 1,3-Dithiols
- Ring Synthesis 816
- 1,3-Dithiolanes
- Ring Synthesis 261, 737, 826
- Reactions with Retention of the Ring Skeleton 555 (5249)
- Ring Transformation 719
● Dithiols
- Alkane-1,3-dithiols
- Cyclization Reactions 826
- Alkene-1,2-dithiols
- Cyclization Reactions 667
● Diynes (conjugated)
- Reactions without Cyclization 723

● Enamides
see: Carboxylic Acid Amides [*N*-(1-Alkenyl)-carboxamides]
● Enamines
- Synthesis 19, 149, 185, 232 (5126), 368, 465, 862 (5331)
- Cyclization Reactions 115, 691
- Reactions without Cyclization 338, 489, 862 (5331)
● Enediols and *O*-Derivatives
- Cyclization Reactions 938 (5355)
● Enols (including *O*-Protected Derivatives)
- Synthesis 232 (5126)
● Enynes (conjugated)
- Synthesis 626 (5259)
- Cyclization Reactions 879
- Tetrachlorobutenyne
- Synthesis 879
● Epoxides (Epoxy Compounds)
see also: Oxiranes
- Synthesis 300, 484 (5217), 605
- Reactions 26, 707, 709, 862 (5330), 905, 931
- Spiro-epoxides
- Synthesis 728
- Vinyloxiranes (3,4-Epoxy-1-alkenes)
- Reactions 528
● Ergocalciferol
- Isomerization 741
● Ester Enolates
- Reactions 631 (5274)
● 9,10-Ethanoanthracene



9,10-Dihydro-

- 9,10-Dihydro-9,10-ethanoanthracenes
- Ring Synthesis 247
● 9,10-Ethenoanthracene

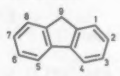


9,10-Dihydro-

- 9,10-Dihydro-9,10-ethenoanthracenes
- Ring Synthesis 716
● Ethers
- Reactions 825
- 1,2-Alkadienyl Ethers
- Reactions 866 (5344)
- 2-Alkenyl 2-Aminoalkyl Ethers
- Synthesis 914
- 1-Alkenyl Ethers (Enol Ethers)
- Synthesis 67, 232 (5126), 236 (5139), 942 (5368)
- Cyclopropanation 87
- Reactions 236 (5139), 320 (5155), 553 (5242), 709 (5286), 792 (5318), 942 (5368)
- 2-Alkoxy-1,3-dienes
- Reactions 866 (5344)
- *C*-Aryloxy-*N*-heterocyclic Compounds
- Synthesis 40
- *C*-Alkoxy-*O*-heterocyclic Compounds
- Synthesis 145
- Alkyl Aryl Ethers
- Reactions 550 (5233), 627 (5263), 772
- Aryl Trichloromethyl Ethers
- Synthesis 40
- Reactions 38
- Bis[1-alkenyl] Ethers
- Reactions 789 (5309)

- Bis[2-alkenyl] Ethers
- Synthesis 235 (5137)
- Reactions 235 (5137), 320 (5156), 911
- 1-Cyanoalkyl 2-Alkenyl Ethers
- Synthesis and Reactions 939 (5361)
- Dialkyl Ethers
- Synthesis 483 (5214)
- Reactions 410 (5199), 549 (5232), 550 (5233), 771
- Diaryl Ethers
- Synthesis 399
- 2-Haloalkyl Ethers
- Synthesis 223, 402, 483 (5214)
- Halomethyl Ethers
- Synthesis and Reactions 588
- 3-Hydroxy-1-alkenyl Ethers
- Synthesis and Reactions 941 (5367)
- Iodomethyl Ethers
- Reactions 588

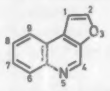
● Ferrocenes
- Reactions with Retention of the Ferrocene System 81
● Fluorene



- 1,2,3,9a-Tetrahydro-9*H*-fluorenes
- Ring Synthesis 189
● *C*-Fluoro Compounds
- Reactions 785 (5297)
- 1,1-Difluoro-1-alkenes
- Synthesis 791 (5316)
- Reactions 4, 5, 6, 458, 791 (5316)
- 1,2-Difluoro-3-hydroxy-1-alkenes
- Synthesis and Reactions 128
- Fluoroalkenes Type C=C–F
- Synthesis 217
- Fluoroarenes
- Synthesis 127
- Fluorocyclobutenes
- Synthesis 4–12
- *C*-Fluoro-*N*-heterocyclic Compounds
- Reactions 760
- N–C–F Compounds
- Synthesis 700
- Perfluoroalkyl Compounds
- Synthesis 836
- Polyfluoroarenes
- Synthesis 127
- Tetrafluoroethylene
- Reactions 113
- Trifluoromethyl Compounds
- Synthesis 937 (5352)
- Reactions 791 (5316)
● Free Radicals

see the individual classes of radicals such as Aminodicyanomethyls, Aroxyls, Hydrazyls, Nitroxyls, Triarylmethyls, Verdazyls, Anion Radicals, etc.
● Fulvalenes
- Pentaheptafulvalenes
- Reactions 126
● Fulvenes
- Heptafulvenes
- Synthesis 196
- Pentafulvenes
- Synthesis 267
- Reactions 72 (5089), 81, 592
- Triafulvenes
- Synthesis 196
● Furan

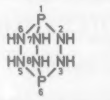
- Furans
- from Like Ring Skeletons 581
- Ring Synthesis 182
- Reactions with Retention of the Ring Skeleton 144
- 2,3-Dihydrofurans
- Ring Synthesis 292, 448, 581
- Reactions with Retention of the Ring Skeleton 792 (5318)
- Ring Transformation 292, 448
● Furocoumarine Natural Products
- Reactions 274
● Furo[2,3-*c*]quinoline



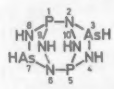
- 4,5-Dihydrofuro[2,3-*c*]quinolines
- Ring Synthesis 508

● Gibberellin Precursors
- Synthesis 189
● Glutamic Acid
- Reactions 291, 685, 752
● Guaianolides and Relatives
- Synthesis 225
● Guanidines
- Cyclization Reactions 780

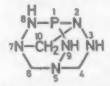
● Heteroaromatic *N*-Oxides
- from Like Ring Skeletons 587
- Ring Transformation 253
● Heterocyclic Compounds
- P–N–N Heterocyclic Compounds
- Synthesis (Review) 557
● 2,3,5,6,7,8-Hexaaza-1,4-diphosphabicyclo[2.2.2]octane



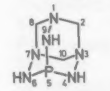
- Ring Synthesis 563
● 2,4,6,8,9,10-Hexaaza-1,5-diphospha-3,7-diarsatricyclo[4.2.1.1^{2,5}]decane



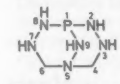
- Ring Synthesis 564
● 2,3,5,7,8,9-Hexaaza-1-phosphatricyclo[3.3.1.1^{2,7}]decane



- Ring Synthesis 570
● 1,3,4,6,7,9-Hexaaza-5-phosphatricyclo[3.3.1.1^{3,7}]decane

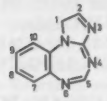


- Ring Synthesis 571
● 2,3,5,7,8,9-Hexaaza-1-phosphatricyclo[3.3.1]nonanes and -3-nonenes



- Ring Synthesis 570, 571
● Hippuric Acid
- Reactions 832
● Hydrazines
- Cyclization Reactions 812, 813
- Reactions without Cyclization 812
- *N'*-Acyl-*N*-aminocarbonylhydrazines
- Cyclization Reactions 562
- *N*-Acyl-*N'*-arylhydrazines
- Synthesis 622
- Cyclization Reactions 562
- *N*-Acyl-*N*-(2-thienyl)-hydrazines
- Reactions without Cyclization 60
- Alkylhydrazines
- Cyclization Reactions 559
- *N*-Amino-*N*-heterocyclic Compounds
- Synthesis 332, 464, 687
- Cyclization Reactions 332
- Arylhydrazines
- Cyclization Reactions 637, 779
- *N,N'*-Diacylhydrazines
- Cyclization Reactions 562
- *N,N*-Dialkylhydrazines
- Cyclization Reactions 562
- Reactions without Cyclization 301
- *C*-Hydrazino-*N*-heterocyclic Compounds
- Synthesis 748, 908
- Cyclization Reactions 748
- Reactions without Cyclization 909
● Hydrazones
- Cyclization Reactions 558, 560
- Reactions without Cyclization 816
- Regeneration of the Carbonyl Compound 323 (5166)
- Aldehyde Hydrazones
- Synthesis 464
- *C*-Alkylidenehydrazino-*N*-Heterocyclic Compounds
- Synthesis 909
- Arylhydrazones
- Synthesis 922
- γ-Haloaldehyde Hydrazones
- Cyclization Reactions 464
- 2-Hydrazonoalkanal Acetals
- Reactions 390
- α-Hydrazonocarboxylic Acid Derivatives
- Synthesis 445, 864 (5336)
- Cyclization Reactions 445
- β-Hydrazonocarboxylic Acid Derivatives
- Cyclization Reactions 60
- Reactions without Cyclization 234 (5134)
- Mono-alkoxycarbonylhydrazones of *vic*-Diketones
- Synthesis and Reactions 485 (5219)
- Monohydrazones of 1,4-Dicarbonyl Compounds
- Cyclization Reactions 687
- Sulfonylhydrazones
- Synthesis 306, 920
- Cyclization Reactions 96
- Reactions without Cyclization 238 (5146), 306, 481 (5207)
- Regeneration of the Carbonyl Compound 919
- α,β-Unsaturated Hydrazones
- Cyclization Reactions 481 (5207)
● Hydrazonic Acid Halides
- Synthesis 383, 604
- Reactions 382, 604
● Hydrocarbons
- from Like Carbon Skeletons 736, 937 (5353)
- from Unlike Carbon Skeletons 231 (5123), 785 (5297)
- Araliphatic Hydrocarbons
- Synthesis 159 (5106), 397, 825
● Hydroperoxy Compounds
- 2-Alkenyl Hydroperoxides
- Synthesis 408 (5190)
- *gem*-Hydroperoxy-siloxy Compounds
- Synthesis and Reactions 550 (5234)
- 1-Hydroxyalkyl Hydroperoxides and Derivatives
- Synthesis and Reactions 67
● Hydroxylamines
- *O,N*-Dialkylhydroxylamines
- Synthesis 679

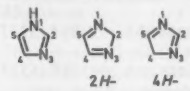
● **Imidazo[1,2-*a*][1,3,5]benzotriazepine**



1*H*-

- **2,3,5,6-Tetrahydro-1*H*-imidazo[1,2-*a*][1,3,5]-benzotriazepines**
- Ring Synthesis 807

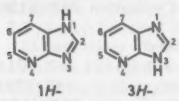
● **Imidazole**



2*H*- 4*H*-

- **Imidazoles**
- from Like Ring Skeletons 675
- Ring Synthesis 741
- **2,5-Dihydroimidazole 1-Oxides**
- Ring Synthesis 807

● **Imidazo[4,5-*b*]pyridine**



1*H*- 3*H*-

- **2,3-Dihydro-1*H*-imidazo[4,5-*b*]pyridines**
- Ring Synthesis 807

● **Imidic Acid Esters**

see: Carboximidic Acid Esters

● **Imines**

- Synthesis 701 (5288)
- Reactions without Cyclization 490
- **Aldimines**
- Synthesis 781
- Cyclization Reactions 62, 487 (5226), 556 (5253)
- Reactions without Cyclization 487 (5226)
- **2-Alkenimines**
- Synthesis 409 (5195)
- Reactions without Cyclization 789 (5308)
- **2-Aminoalkanimines**
- Cyclization Reactions 591
- ***vic*-Bis-imines**
- Synthesis 894
- **2-Iminoalkanal Acetals**
- Reactions 390
- **α-Iminocarboxylic Acid Derivatives**
- Synthesis 894, 895
- Reactions without Cyclization 330
- **Ketimines**
- Synthesis 409 (5194)
- Reactions without Cyclization 409 (5194) (5195), 485 (5218), 811
- ***N*-Metal Derivatives of Imines**
- Reactions 492
- ***N*-Phosphinylimines**
- Synthesis and Reactions 522
- **Quinone Diimines**
- Reactions 363

● **Iminium Salts**

- **Alkaniminium Salts**
- Reactions 72 (5090)
- **Halomethaniminium Salts**
- Reactions 274

● **Iminodicarboxylic Esters**

- Synthesis and Reactions 632 (5277)

● **Iminophosphorus Trihalides**

- Synthesis 265

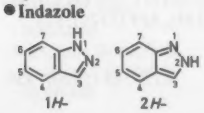
● ***N*-Imino Ylides**

- ***N*-Iminoaminium Ylides**
- Synthesis and Reactions 301

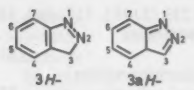
● **Indanetrione-derived Dyes**

- Synthesis 198

● **Indazole**



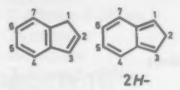
1*H*- 2*H*-



3*H*- 3a*H*-

- **1*H*-Indazoles**
- Ring Synthesis 633
- **3*H*-Indazoles**
- Ring Synthesis and Transformation 595
- **2,3-Dihydro-1*H*-indazoles**
- Ring Synthesis 633

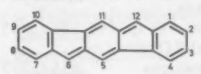
● **Indene**



2*H*-

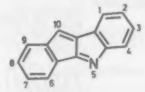
- **Indanes**
- Anellation Reactions 199
- **2,3,3a,4,5,6-Hexahydroindenes**
- Ring Synthesis 342
- **2,3,4,5,6,7-Hexahydroindenes**
- Ring Synthesis 628 (5266), 786 (5300)

● **Indeno[1,2-*a*]fluorene**



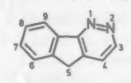
- **7,12-Dihydroindeno[1,2-*a*]fluorenes**
- Ring Synthesis 201

● **Indeno[1,2-*b*]indole**



- **5,10-Dihydroindeno[1,2-*b*]indoles**
- Ring Synthesis 607

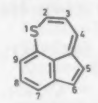
● **Indeno[2,1-*c*]pyridazine**



5*H*-

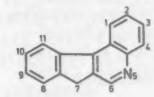
- **2,3-Dihydro-5*H*-indeno[1,2-*c*]pyridazines**
- Ring Synthesis 199
- **2,3-Dihydro-9*H*-indeno[2,1-*c*]pyridazines**
- Ring Synthesis 186

● **Indeno[4,3a,3-*bd*]thiepin**



- **2,3,4,6-Tetrahydroindeno[4,3a,3-*bd*]thiepins**
- Ring Synthesis 263

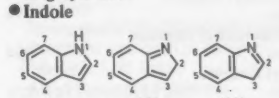
● **Indeno[2,1-*c*]quinoline**



7*H*-

- **7*H*-Indeno[2,1-*c*]quinolines**
- Ring Synthesis 889
- **5,6-Dihydro-7*H*-indeno[2,1-*c*]quinolines**
- Ring Synthesis 889

● **Indole**



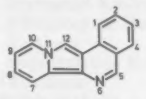
2*H*- 3*H*-

- **Indoles**
- Ring Synthesis 445
- Anellation Reactions 607, 685
- Reactions with Retention of the Ring Skeleton 374
- **3*H*-Indole 1-Oxides**
- Ring Synthesis 931
- **2,3-Dihydroindoles**
- from Like Ring Skeletons 149

● **Indolizine**

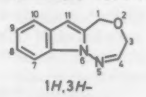
- Ring Synthesis 207

● **Indolizino[1,2-*c*]isoquinoline**



- **5,6,6b,7,8,9,10,12-Octahydroindolizino[1,2-*c*]isoquinolines**
- Ring Synthesis 798

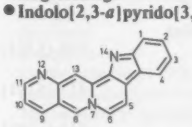
● **Indolo[2,1-*c*][1,4,5]oxadiazepine**



1*H*,3*H*-

- **11,11a-Dihydro-1*H*,3*H*-indolo-[2,1-*c*][1,4,5]oxadiazepines**
- Ring Synthesis 332
- **4,5,11,11a-Tetrahydro-1*H*,3*H*-indolo-[2,1-*c*][1,4,5]oxadiazepines**
- Ring Cleavage 332

● **Indolo[2,3-*a*]pyrido[3,4-*g*]quinolizine**



- **5,6,8,14-Tetrahydroindolo-[2,3-*a*]pyrido[3,4-*g*]quinolizines**
- Ring Synthesis 518

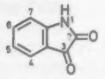
● ***C*-Iodo Compounds**

- Reactions 785 (5297)
- **Aryliodomethanes**
- Synthesis 435
- **Iodoalkanes**
- Synthesis 364, 405 (5181), 476, 549 (5232), 550 (5233), 708 (5281), 727, 785 (5299)
- Reactions 714, 785 (5299)
- **2-Iodoalkanols and *O*-Derivatives**
- Synthesis 402
- **Iodoalkenes Type C=C–J**
- Synthesis 159 (5104), 551 (5236)
- Reactions 626 (5259), 631 (5274), 860 (5324)
- **Iodoalkenes Type C=C–C–J**
- Synthesis 370
- Reactions 162 (5115)
- **1-Iodoalkyl Sulfones**
- Synthesis 883
- **Iodoalkynes Type C≡C–C–J**
- Synthesis 549 (5232)
- **Iodoallenes**
- Synthesis 410 (5198)
- **Iodoarenes**
- Synthesis 551 (5237)
- **α-Iodocarbonyl Compounds**
- Synthesis 865 (5342)
- **α-Iodocarboxylic Acid Derivatives**
- Synthesis 407 (5187)
- ***C*-Iodo-*N*-heterocyclic Compounds**
- Synthesis 177
- **Iodomethyl Ethers**
- Synthesis 588
- ***gem*-Iodonitro Compounds**
- Synthesis 550 (5235)
- **Iodophenols**
- Reactions 86

● **Iodonium Salts**

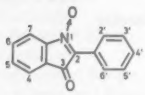
- Reactions 822, 836

● **Isatins**



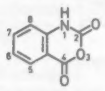
- Reactions with Retention of the Ring Skeleton 149, 201
- Ring Transformation 639

● **Isatogens**



- Synthesis 931

● **Isatoic Anhydrides**

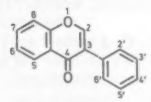


- Ring Transformation 276

● **Isocyanates**
- **Aryl Isocyanates**
- Cyclization Reactions 378
- Reactions without Cyclization 376, 378, 379
- **Chlorosulfonyl Isocyanate**
- Reactions without Cyclization 374, 737
- **Imidoyl Isocyanates**
- Synthesis and Cyclization Reactions 760

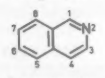
● **Isocyanides**
- **1-Alkenyl Isocyanides**
- Reactions 486 (5223)
- **Alkyl Isocyanides**
- Synthesis 411 (5201)
- **Aryl Isocyanides**
- Synthesis 411 (5201)
- Cyclization Reactions 17
- Reactions involving Ring Transformations 665
- **Isocyanoacetic Esters**
- Cyclization Reactions 461
- **α-Isocyanocarboxylic Acid Derivatives**
- Synthesis 840
- Cyclization Reactions 741
- Reactions without Cyclization 840
- **1-Silyl-1-alkenyl Isocyanides**
- Synthesis 486 (5223)
- **1-Sulfonylalkyl Isocyanides**
- Cyclization Reactions 733
- Reactions without Cyclization 411 (5202), 733, 867 (5346), 941 (5365)

● **Isoflavones**



- Ring Synthesis 843

● **Isoquinoline**



- **Isoquinolines**
- Synthesis and Reactions with Retention of the Ring Skeleton 149
- **1,2-Dihydroisoquinolines**
- Ring Synthesis 461
- **1,2,3,4-Tetrahydroisoquinolines**
- Ring Synthesis 62
- Anellation Reactions 500
- **1,2,5,6,7,8-Hexahydroisoquinolines**
- Ring Synthesis 461
- **2,3,5,6,7,8-Hexahydroisoquinolines**
- Ring Synthesis 183

● **Isothiazole**
see: 1,2-Thiazole

● **Isothiocyanates**
- Synthesis 239 (5148), 717, 804, 810
- **1-Alkenyl Isothiocyanates**
- Synthesis 811
- **Alkoxycarbonyl Isothiocyanates**
- Reactions without Cyclization 831
- **1-Haloalkyl Isothiocyanates**
- Synthesis 811
- ***N*-Isothiocyanatoamines**
- Synthesis 812, 816
- **Sulfonyl Isothiocyanates**
- Synthesis 819

● **Isoxazole**
see: 1,2-Oxazole

● **Jasmone and Relatives**
- Synthesis 221, 627 (5261)

● **Ketene Derivatives**
- **Dicyanoethylenedithiolates**
- Synthesis and Reactions 261
- **Dicyanoketene *S,S*-Acetals**
- Synthesis 261
- **Dicyanoketene *Se,Se*-Acetals**
- Synthesis 261
- **Ketene *O,O*-Acetals**
- Reactions 400, 486 (5221), 938 (5355)
- **Ketene *S,S*-Acetal *S*-Oxides**
- Synthesis and Reactions 865 (5339)
- **Ketene *S,S*-Acetals**
- Synthesis 276, 327 (5176), 364
- Reactions 364
- **Ketene *O*-Alkyl *O*-Silyl Acetals**
- Synthesis 859 (5320)
- Reactions 487 (5226), 859 (5320)
- **Ketene Silyl Acetals**
- Reactions 237 (5141)

● **Ketenes**
- Cyclization Reactions 7, 117
- **Cycloaliphatic Ketenes**
- Cyclization Reactions 111
- **Dihaloketenes**
- Cyclization Reactions 7

● **Ketones**
- from Like Carbon Skeletons 63, 212, 297, 320 (5157), 323 (5166), 324 (5167), 410 (5199), 534, 554 (5245), 788 (5307), 790 (5311) (5312), 865 (5341), 919
- from Unlike Carbon Skeletons 410 (5197), 714, 716, 717, 725, 732, 787 (5304), 789 (5308), 941 (5365)
- Cyclization Reactions 239 (5149), 486 (5223), 832
- Oxirane Formation 35, 552 (5241), 625 (5255), 823
- Reactions without Cyclization 67, 131, 133, 141, 161 (5110), 162 (5115), 163 (5117), 164 (5120), 219, 233 (5129), 236 (5139), 238 (5146), 239 (5149), 321 (5192), 409 (5195), 411 (5202), 479, 554 (5246), 625 (5255), 628 (5264), 711 (5291), 715, 747, 790 (5313), 791 (5316), 859 (5322), 861 (5328), 863 (5333), 891, 899, 938 (5357), 940 (5363), 941 (5367)
- ***C*-Acyl-*N*-heterocyclic Compounds**
- Synthesis 295, 675
- ***C*-Acyl-*O*-heterocyclic Compounds**
- Synthesis 448
- ***C*-Acyl-*S*-heterocyclic Compounds**
- Synthesis and Reactions 368
- **4,7-Alkadienyl Ketones**
- Synthesis 934
- **4,7,11-Alkatrienyl Ketones**
- Synthesis 934
- **1-Alkenyl Ketones**
- Synthesis 162 (5113) (5114), 323 (5165), 616, 629 (5269), 630 (5270) (5271), 720, 725, 726, 848, 859 (5320), 860 (5323), 940 (5364)
- Cyclization Reactions 122, 159 (5105), 192, 481 (5209), 486 (5221), 712 (5296)
- Cyclopropanation 90
- Reactions without Cyclization 160 (5108), 162 (5114), 163 (5116), 323 (5165), 325 (5170), 612, 626 (5258), 629 (5268), 714, 788 (5307), 860 (5325), 942 (5370)
- **2-Alkenyl Ketones**
- Synthesis 548 (5230), 612, 787 (5305), 934, 939 (5361)
- Reactions without Cyclization 612
- **3-Alkenyl Ketones**
- Synthesis 626 (5258), 789 (5309)
- **4-Alkenyl Ketones**
- Synthesis 612
- Cyclization Reactions 861 (5327)
- **5-Alkenyl Ketones**
- Cyclization Reactions 860 (5327)
- **1-Alken-3-ynyl Ketones**
- Synthesis 554 (5247)
- **2-Alkoxy-1-alkenyl Ketones**
- Reactions without Cyclization 554 (5247)
- **Alkyl Aryl Ketones**
- Synthesis 149, 236 (5139), 406 (5184), 671, 735, 936
- Reactions without Cyclization 159 (5106), 162 (5113)
- **Alkyl Ketones, General**
- Synthesis 324 (5169), 483 (5215)
- Cyclization Reactions 487 (5225)
- Reactions without Cyclization 232 (5128), 324 (5168)
- **1-Alkynyl Ketones**
- Synthesis 307
- Reactions without Cyclization 161 (5111), 938 (5356)
- **3-Alkynyl Ketones**
- Synthesis 163 (5116)
- **2-Amino-1-alkenyl Ketones**
- Synthesis 497
- **2-Aminoalkyl Ketones**
- Synthesis 236 (5140)
- **Aryl Benzyl Ketones and Hetero Analogs**
- Synthesis 149
- **Aryl Styryl Ketones**
- Synthesis and Reactions 931
- **Benzocycloalkenones**
- Reactions 319 (5153)
- **Bis[1-alkenyl]Ketones**
- Cyclization Reactions 272
- **Bis[1-haloalkyl]Ketones**
- Cyclization Reactions 902
- **3-Cyanoalkyl Ketones**
- Synthesis 589
- **Cyclic α-Methyleneketones**
- Cyclization Reactions 52
- Cyclopropanation 90
- **Cycloalkanones**
- Synthesis 233 (5129) (5130), 483 (5213), 488 (5229), 628 (5265)
- Reactions 162 (5114), 236 (5140), 240 (5150), 326 (5174), 386, 400, 406 (5186), 629 (5267), 944 (5378)
- **Cycloalkenones**
- Synthesis 162 (5114), 406 (5186), 550 (5234), 866 (5343)
- Cyclopropanation 83
- Reactions 43, 71 (5087), 162 (5114), 483 (5213), 628 (5265)
- **Cyclopropyl Ketones**
- Synthesis 733
- **Dialkyl Ketones**
- Synthesis 73 (5094), 160 (5109), 316, 236 (5139), 358, 429, 432, 552 (5241), 671, 867 (5348), 897, 940 (5362) (5363)
- Cyclization Reactions 191
- Reactions without Cyclization 72 (5091), 162 (5113), 231 (5125), 235 (5135), 322 (5163), 552 (5239), 859 (5320), 939 (5358)
- **Diaryl Ketones**
- Synthesis 672, 789 (5310), 936

- Reactions without Cyclization 159 (5106), 409 (5194), 608, 763
- Dibenzyl Ketones
- Synthesis 484 (5216)
- Enolizable Ketones
- Reactions without Cyclization 487 (5224)
- 1,2-Epoxyalkyl Ketones
- Synthesis 484 (5217), 931
- Reactions 628 (5266), 931
- 1-Halo-1-alkenyl Ketones
- Synthesis 29, 320 (5155), 458
- 1-Haloalkyl Ketones
- Synthesis 139, 141, 231 (5125), 233 (5129), 865 (5342)
- Reactions without Cyclization 164 (5122), 485 (5219), 628 (5264)
- 2-Haloalkyl Ketones
- Synthesis 620
- 3-Haloalkyl Ketones
- Synthesis 227
- α-Halobenzyl Ketones
- Reactions 604
- Hexafluoroacetone
- Reactions 524
- 3-Hydroxy-2-alkenyl Ketones and *O*-Derivatives
- Synthesis and Reactions 866 (5344)
- 4-Hydroxy-3-alkenyl Ketones and *O*-Derivatives
- Synthesis 860 (5325)
- 1-Hydroxyalkyl Ketones and *O*-Derivatives
- Synthesis 485 (5219), 630 (5270) (5271)
- Cyclization Reactions 182
- 2-Hydroxyalkyl Ketones and *O*-Derivatives
- Synthesis 628 (5264)
- 3-Hydroxyalkyl Ketones and *O*-Derivatives
- Synthesis 390, 724, 861 (5328)
- 1-Isocyano-1-sulfonylalkyl Ketones
- Synthesis and Reactions 867 (5346)
- 1-Mercaptoalkyl Ketones and *S*-Derivatives
- Synthesis 306, 322 (5161), 629 (5267), 720
- Reactions without Cyclization 306, 940 (5364)
- 2-Mercaptoalkyl Ketones and *S*-Derivatives
- Synthesis 710 (5287)
- 1-Nitroalkyl Ketones
- Synthesis 478
- Non-enolizable Ketones
- Reactions 723
- Polyenic Ketones (non-conjugated)
- Synthesis 240 (5151)
- 2-Selenylalkyl Ketones and *Se*-Derivatives
- Synthesis 710 (5287)
- α-Sulfinyl Ketones
- Cyclization Reactions 373

● Lactams
- Synthesis 614
- 3-Alkanelactams
- Synthesis 328 (5178), 487 (5226), 944 (5377)
- Reactions 747, 944 (5377)
- 4-Alkanelactams
- Synthesis 412 (5204), 614, 685
- 5-Alkanelactams
- Synthesis 614
- 6-Alkanelactams
- Synthesis 614
- 2-Alkylidene-3-alkanelactams
- Synthesis 747
- 4-Carboxy-4-alkanelactams
- Synthesis 291
- 3-Oxomorpholines
- Synthesis 743
- *N*-Silyllactams
- Reactions 810

● Lactone Derivatives
- Lactone *S,S*-Acetals
- Synthesis 719

● Lactones
- Synthesis 328 (5179), 715, 944 (5378)
- Reactions 719, 863 (5334), 864 (5337), 942 (5369), 943 (5374)
- 3-Acyl-2-oxo-4-alkanolides
- Synthesis and Reactions 162 (5113)
- 4-Alkanolides
- Synthesis 304, 556 (5254), 792 (5318)
- 5-Alkanolides
- Synthesis 430, 792 (5318)
- 6-Alkanolides
- Synthesis 239 (5147), 944 (5378)
- 2-Alkene-4-olides
- Synthesis 144, 225, 476
- Reactions 225
- 2-Alken-5-olides
- Synthesis 553 (5244)
- Benzo-fused Lactones
- Reactions 66
- Bicyclic Lactones
- Synthesis 792 (5319)
- 3,4-Dialkoxycarbonyl-4-alkanolides
- Synthesis and Reactions 791 (5315)
- 3-Hydroxy-4-alkanolides
- Synthesis 628 (5264)
- ω-Hydroxyalkanolides
- Reactions 632 (5276)
- Macrocyclic Lactones
- Synthesis 412 (5205), 632 (5276)
- 2-Methylene-4-alkanolides
- Synthesis 386, 418, 476
- 2-Methylene-5-alkanolides
- Synthesis 210
- α-Methylenelactones
- Synthesis 728

● (*S*)-Laudanosine
- Synthesis 335

● Leucine
- Reactions 418

● Malodinitriles
- Reactions, Review 241
- 2-Alkenylidenemalodinitriles
- Synthesis 189, 250
- Cyclization Reactions 250
- Alkylidenemalodinitriles
- Synthesis 56, 186, 268
- Cyclization Reactions 13, 14
- Reactions without Cyclization 486 (5222)
- Alkylmalodinitriles
- Synthesis 187, 486 (5222), 532
- 1-Amino-2-cyanoalkylidenemalonitriles
- Synthesis and Reactions 172
- Aminomalodinitriles
- Synthesis 274
- Cyclization Reactions 249
- Cycloalkylidenemalodinitriles
- Synthesis 183
- Dihalomalodinitriles
- Cyclization Reactions 40, 262
- Reactions without Cyclization 38
- 2-Haloalkylidenemalodinitriles
- Cyclization Reactions 173
- Hydrazonomalodinitriles
- Synthesis 922
- Malodinitrile
- Synthesis 166
- Cyclization Reactions 171, 243, 681
- Reactions without Cyclization 165, 241
- Physical Properties 167
- Toxicity 167
- Mesoxalodinitrile (Carbonyl Cyanide)
- Reactions without Cyclization 256

● Malonic Acid Esters
- Alkyl Hydrogen Malonates
- Reactions 143
- Alkylidenemalonic Esters
- Synthesis 74 (5096)
- Reactions 150
- Alkylmalonic Esters
- Synthesis 867 (5348)
- 3-Alkynylmalonic Esters
- Synthesis 150
- Aminomalonic Esters
- Cyclization Reactions 412 (5204)
- Dialkyl Malonates
- Cyclization Reactions 712 (5296)
- Dialkylmalonic Esters
- Synthesis 867 (5348)
- 1-Haloalkylidenemalonic Esters
- Reactions without Cyclization 74 (5096)
- Halomalonic Esters
- Cyclization Reactions 66, 481 (5209)
- *S*-Heterocyclic Malonic Esters
- Synthesis 327 (5176)
- Isopropylidene Malonate (Meldrum Acid)
- Reactions 386

● Malonic Acids
- Alkylidenemalonic Acids
- Synthesis 56

● Mercaptans
see: Thiols

● Mesoxalodinitrile
see: Malodinitriles

● Metal Complexes
- Alkene-cyclopentadienyl-carbonyl-iron Complexes
- Reactions 328 (5178)
- Allylpalladium Complexes
- Reactions 732
- Arenetricarbonylchromium Complexes
- Synthesis 937 (5354)
- Complexes Containing Malodinitriles as Ligands
- Synthesis 266, 279
- Reactions 266
- Cyclopentadienyl Zirkonium Complexes
- Synthesis and Reactions 626 (5258)
- Magnesium Pyrophosphate Complexes
Synthesis 519
- Metal-*N*-Heteroarene Complexes
- Reactions 47
- Molybdenum Chelate Complexes
- Synthesis 76 (5101)
- Thiocarbonyliridium Complexes
- Synthesis 819
- Thiocarbonyltungsten Complexes
- Synthesis 819

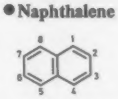
● *N*-Metal Compounds
- Aminoaluminium Compounds
- Reactions 409 (5194), 863 (5334)
- Lithium Amides
- Reactions 679

● Methylal
- Reactions 588

● Methyl Compounds
- *C*-Methyl-heterocyclic Compounds
- Reactions 938 (5357)

● Monosaccharides and Derivatives
- Reactions 48
- Aldopentoses
- Reactions 42
- Anhydrodeoxyhexitols and Derivatives
- Reactions 696
- Deoxypentitols and *O*-Derivatives
- Synthesis 42
- *O,O*-Methylenemonosaccharides
- Synthesis 48

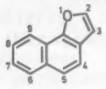
● Naphthalene



- Naphthalenes
- Anellation Reactions 509, 589, 774
- Reactions with Retention of the Ring Skeleton 436
- Ring Transformation 82
- 1,2-Dihydronaphthalenes
- from Like Ring Skeletons 589
- 1,2,3,4-Tetrahydronaphthalenes (Tetralins)

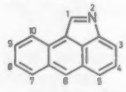
- Ring Synthesis 52, 319 (5153), 932
- 1,2,3,4,5,6-Hexahydronaphthalenes
- Ring Synthesis 52
- 1,2,3,4,5,8-Hexahydronaphthalenes
- Ring Synthesis 938 (5355)
- 1,2,3,4,4a,5,6,7-Octahydronaphthalenes
- Ring Synthesis 482 (5212)
- 1,2,3,4,4a,5,6,8a-Octahydronaphthalenes
- Ring Synthesis 786 (5300)
- 1,2,3,4,5,6,7,8-Octahydronaphthalenes
- Ring Synthesis 52, 938 (5355)

● Naphtho[1,2-*b*]furan



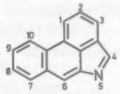
- Ring Synthesis 203

● Naphtho[1,2,3-*cd*]indole



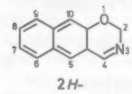
- 1,2,2a,3,4,5,5a,6,10b,10c-Decahydronaphtho[1,2,3-*cd*]indoles
- Ring Synthesis 796

● Naphtho[3,2,1-*cd*]indole



- 4,6-Dihydronaphtho[3,2,1-*cd*]indoles
- Ring Synthesis 607

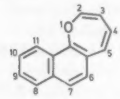
● Naphtho[2,3-*e*]-1,3-oxazine



2*H*-

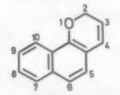
- 3,4-Dihydro-2*H*-naphtho[2,3-*e*]-1,3-oxazines
- Ring Synthesis 809

● Naphtho[1,2-*b*]oxepin

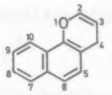


- 2,3,4,5,5a,6,7,11b-Octahydronaphtho[1,2-*b*]oxepins
- Ring Synthesis 798

● Naphtho[1,2-*b*]pyran



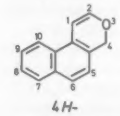
2*H*-



4*H*-

- 3,4,4a,5,6,10b-Hexahydro-2*H*-naphtho[1,2-*b*]pyrans
- Ring Synthesis 798

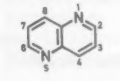
● Naphtho[2,1-*c*]pyran



4*H*-

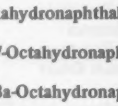
- 1,2,4a,5,6,10b-Hexahydro-4*H*-naphtho[2,1-*c*]pyrans
- Ring Synthesis 798

● 1,5-Naphthyridine



- 1,2,3,4-Tetrahydro-1,5-naphthyridines
- Ring Synthesis 507

● 1,6-Naphthyridine



- 5,6-Dihydro-1,6-naphthyridines
- Ring Synthesis 461
- 1,2,3,4-Tetrahydro-1,6-naphthyridines
- Ring Synthesis 507

● 1,7-Naphthyridine

- 1,2,3,4-Tetrahydro-1,7-naphthyridines
- Ring Synthesis 507

● 1,8-Naphthyridine

- 1,8-Naphthyridines
- Ring Synthesis 253
- 1,2,3,4-Tetrahydro-1,8-naphthyridines
- Ring Synthesis 506

● Nitric Acid Esters
- Synthesis 452

● Nitrile Oxides
- Synthesis or Generation *in situ* and Cyclization Reactions 43

● Nitriles
- from Like Carbon Skeletons 238 (5145), 301, 632 (5275), 702, 703, 905
- Reactions without Cyclization 149, 303, 865 (5339), 917
- Acetonitrile
- Reactions without Cyclization 166
- 2-Acyl-2-alkenenitriles
- Cyclization Reactions 273
- Alkanenitriles
- Synthesis 72 (5089), 238, 316, 326 (5175), 733
- Reactions without Cyclization 310, 360, 548, 829
- 2-Alkenenitriles
- Synthesis 56, 235 (5135), 310, 454, 868 (5349)
- Cyclization Reactions 206
- Reactions without Cyclization 72 (5089), 238 (5144)
- 2-Alkynenitriles
- Reactions without Cyclization 72 (5089), 454
- Aminoacetonitriles
- Reactions without Cyclization 897
- 2-Aminoalkanenitriles
- Synthesis 552 (5239), 896
- Reactions without Cyclization 896
- 2-Amino-2-alkenenitriles
- Synthesis and Reactions 897
- 3-Amino-2-alkenenitriles
- Synthesis 892
- 3-Amino-3-cyanoiminoalkanenitriles
- Synthesis and Cyclization Reactions 673
- Aromatic Nitriles
- Reactions without Cyclization 668, 722
- 3-Arylalkanenitriles
- Synthesis 590
- Arylglyoxylonitriles (Aroyl Cyanides)
- Synthesis 556 (5252)
- Cyclohexenacetonitriles
- Synthesis 364
- 2,2-Dihaloalkanenitriles
- Reactions without Cyclization 39
- 2-Haloalkanenitriles
- Synthesis 238 (5144)
- Cyclization Reactions 556 (5253)
- 7-Halo-8-alkoxy-3-alkenenitriles
- Synthesis 605
- *N*-Heterocyclic Nitriles
- Synthesis 173, 175, 177, 207, 243, 374, 445
- *O*-Heterocyclic Nitriles
- Synthesis 182, 183
- 2-Hydroxyalkanenitriles and *O*-Derivatives
- Synthesis 161 (5110), 219, 632 (5275), 863 (5333)
- Reactions without Cyclization 866 (5344), 939 (5361)
- 4-Hydroxyalkanenitriles and *O*-Derivatives
- Reactions without Cyclization 221
- 2-Iminoalkanenitriles
- Synthesis 894, 895
- 2-Mercaptoalkannitriles and *S*-Derivatives
- Synthesis 360
- 4-Oxoalkanenitriles
- Synthesis 631 (5272)
- Reactions without Cyclization 406 (5186)
- Phenylacetonitriles
- Reactions without Cyclization 892
- Polyenecarbonitriles
- Synthesis 263
- 2-Sulfonylalkanenitriles
- Synthesis 486 (5222)
- 2-Sulfonyl-2-alkenenitriles
- Reactions without Cyclization 486 (5222)
- Trihaloacetonitriles
- Reactions 38

● *C*-Nitro Compounds (including *aci*-Nitro Compounds)
- Arylnitromethanes
- Reactions 55
- *vic*-Dinitroalkanes
- Synthesis and Reactions 482 (5210)
- Dinitroarenes
- Reactions 924
- *gem*-Halonitro Compounds
- Synthesis 550 (5235)
- Reactions 55
- Heterocyclic *C*-Nitro Compounds
- Reactions 23
- Nitroalkanes
- Synthesis 484 (5216)
- Reactions 324 (5167), 478, 482 (5210), 550 (5235), 632 (5275)
- Nitroalkenes Type C=C–NO_2
- Synthesis 484 (5216), 592
- Reactions 72 (5089), 484 (5216)
- Nitroanilines
- Synthesis 925
- Nitroarenes
- Synthesis 690
- Reactions 23, 56, 59, 436, 834, 931
- α-Nitrocarbonyl Compounds
- Synthesis 478
- 5-Nitro-1,3-diketones
- Reactions 322 (5163)
- Nitroperfluoroalkanes
- Synthesis 836

● *N*-Nitro Compounds
- Nitramines
- Synthesis 787 (5302)
- Reactions 700
- Nitrimines
- Reactions 787 (5302)
- *N*-Nitropeptides
- Reactions 76 (5103)

● *C*-Nitroso Compounds
- Nitrosoalkanes
- Reactions 937 (5352)
- Nitrosoarenes
- Reactions 892

● *N*-Nitroso Compounds
- Reactions 93, 95, 96

● Nitroxyls
- Reactions 583, 914

● Nucleosides
- Synthesis 908

● "Organic Metals"
- Properties 280
● Organoaluminum Compounds
- Dialkylaluminum Amides
- Reactions 409 (5194)
- Trialkylalanes
- Reactions 74 (5097)
● Organocopper Compounds
- 1-Alkenylcopper(I)
- Reactions 528, 625 (5256)
- Bis[1-alkenyl]-copper
- Reactions 528
- Organocuprates
- Synthesis 709 (5284)
- Reactions 71 (5087), 72 (5091), 73 (5092), 159 (5104), 231 (5123), 454, 528, 625 (5256), 709 (5284), 714, 785 (5297) (5298), 860 (5325)
- P–CCu Compounds
- Reactions 37
● Organolithium Compounds
- *C–S* Coupling Reactions 577
- 1-Alkenyllithium
- *C–C* Coupling Reactions 528, 862 (5331), 941 (5367)
- Other Reactions 862 (5331)
- 2-Alkenyllithium (Allyllithium Compounds)
- *C–C* Coupling Reactions 321 (5158)
- Alkyllithium
- Synthesis 707 (5279)
- *C–C* Coupling Reactions 707 (5279), 857
- 1-Alkynyllithium
- *C–C* Coupling Reactions 26, 307, 408 (5192) (5193)
- Aryllithium
- *C–C* Coupling Reactions 319 (5154), 857
- Other Reactions 319 (5154)
- 1-Aryloxy-1-alkenyllithium
- *C–C* Coupling Reactions 791 (5316)
- As-CLi Compounds
- Reactions 785 (5299)
- Dihalomethyllithium
- *C–C* Coupling Reactions 233 (5129) (5130)
- Enamine Lithium Derivatives
- Reactions 390
- 1-Halo-1-alkenyllithium
- Synthesis and *C–C* Coupling Reactions 458
- *gem*-Halolithio Compounds
- Reactions 552 (5241)
- α-Lithiocarboxylic Acid Derivatives
- Synthesis 828
- Reactions 221, 324 (5169), 476, 791 (5315), 828
- *C*-Lithio-1,3-dithianes
- Reactions 629 (5268)
- *C*-Lithio-heterocyclic Compounds
- *C–C* Coupling Reactions 149, 939 (5358)
- 1-Lithioisocyanides
- Reactions 486 (5223)
- Lithium Organocuprates
see: Organocopper Compounds
- N–CLi Compounds
- *C–C* Coupling Reactions 409 (5194)
- P–CLi Compounds
- Synthesis 27, 29, 31, 33
- Reactions 27, 29, 31, 33, 37
- P–C(Hal)-Li Compounds
- Reactions 682
- S–CLi Compounds
- *C–C* Coupling Reactions 322 (5161), 407 (5189), 483 (5213), 711 (5291), 721, 722
- Si–CLi Compounds
- Reactions 483 (5213)
- Si–CHalLi Compounds
- Synthesis and Reactions 625 (5255)
- Sn–CLi Compounds
- *C–C* Coupling Reactions 483 (5213), 859 (5322)
● Organomagnesium Compounds
- *C–C* Coupling Reactions 21, 403, 411 (5200), 483 (5214), 555 (5248), 662, 757, 860 (5324)
- 1-Alkenylmagnesium Halides
- *C–C* Coupling Reactions 528, 611
- Alkylmagnesium Halides
- *C–C* Coupling Reactions 221, 388, 617, 857
- Other Reactions 625 (5256), 822
- Arylmagnesium Halides
- *C–S* Coupling Reactions 577
- Si–CMgX Compounds
- *C–C* Coupling Reactions 553 (5244)
● Organomanganese Compounds
- Reactions 861 (5328)
● Organomercury Compounds
- Type R–HgX
- Synthesis 911
- Reactions 914
● Organopentafluorosilicates
- Synthesis and Reactions 708(5281)
● Organopotassium Compounds
- Reactions 472
● Organosodium Compounds
- Sodiomalonic Acid Derivatives
- Reactions 867 (5348)
- Sodium Salts of Strong *CH*-Acids
- Synthesis and Reactions 472
● Organosulfur Compounds
- Synthesis and Reactions (Review) 713
● Organotin Compounds
see: Stannanes
● Organozinc Compounds
- 2-Alkenyl Zinc Halides
- Synthesis and Reactions 838
- 1-Alkynylzinc Halides
- Reactions 626 (5259)
- 2-Alkynylzinc Halides
- Synthesis and Reactions 150, 838
- Organozincates
- Reactions 628 (5265)
● Orthocarboxylic Acid Esters
- Synthesis 283
- Reactions 565, 566
- Trialkyl Orthoalkanoates
- Reactions 532
● 7-Oxabicyclo[4.1.0]heptane

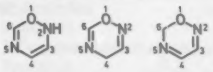
- Ring Transformation 476
● 1,3,4,2,5-Oxadiazadiphosphole

- Tetrahydro-1,3,4,2,5-oxadiazadiphospholes
- Ring Synthesis 562
● 1,3,4,2-Oxadiazaphosphole

- 2,3-Dihydro-1,3,4,2-oxadiazaphospholes
- Ring Synthesis 562, 566
- 2,3-Dihydro-P^V-1,3,4,2-oxadiazaphospholes
- Ring Synthesis 573, 575
● 1,3,4,2-Oxadiazaphosphorin

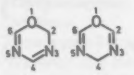
6*H*-

- 2,3-Dihydro-6*H*-1,3,4,2-oxadiazaphosphorins
- Ring Synthesis 567
- Tetrahydro-1,3,4,2-oxadiazaphosphorins
- Ring Synthesis 567
● 1,2,5-Oxadiazine



2*H*- 4*H*- 6*H*-

- 5,6-Dihydro-4*H*-1,2,5-oxadiazines
- Ring Synthesis 807
● 1,3,5-Oxadiazine

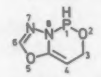


2*H*- 4*H*-

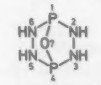
- 5,6-Dihydro-2*H*-1,3,5-oxadiazines
- Ring Synthesis, Cleavage, and Transformation 524
● 1,2,4-Oxadiazole

- 4,5-Dihydro-1,2,4-oxadiazoles
- Ring Synthesis 809
- Tetrahydro-1,2,4-oxadiazoles
- Ring Synthesis 809
● 1,3,4-Oxadiazole

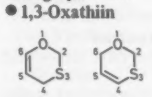
- 2,3-Dihydro-1,3,4-oxadiazoles
- Ring Synthesis 812
● [1,3,4]Oxadiazolo[3,2-*c*][1,3,2]oxazaphosphorin



- Tetrahydro[1,3,4]oxadiazolo-[3,2-*c*][1,3,2]oxazaphosphorins
- Ring Synthesis 569
● Oxamic Acid Esters
- Reactions 632 (5277), 857
● 7-Oxa-2,3,5,6-tetraaza-1,4-diphosphabicyclo[2.2.1]heptane

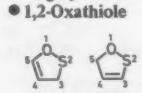


- Ring Synthesis 563
● 1,3-Oxathiin



4*H*- 6*H*-

- 1,3-Oxathianes
- Ring Synthesis 286
● 1,2-Oxathiole



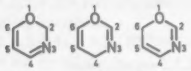
3*H*- 5*H*-

- 1,2-Oxathiolane 2-Oxides
- Ring Transformation 579
● 1,3-Oxathiole

- 1,3-Oxathiolanes
- Ring Synthesis 286, 719
● 1,3,2-Oxazaphosphorin

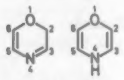
2*H*-

- Tetrahydro-1,3,2-oxazaphosphorins
- Ring Synthesis 569
● 1,3-Oxazine



2*H*- 4*H*- 6*H*-

- 6*H*-1,3-Oxazines
- Ring Synthesis 41
- Tetrahydro-1,3-oxazines
- Ring Synthesis 807
● 1,4-Oxazine



2*H*- 4*H*-

- Morpholines
- Ring Synthesis 911
● 1,2-Oxazole

- 1,2-Oxazoles
- Ring Synthesis 830
- 4,5-Dihydro-1,2-oxazole 2-Oxides
- Ring Synthesis 55
● 1,3-Oxazole

- 1,3-Oxazoles
- Ring Synthesis 461
- Ring Transformation 254, 461
- 2,5-Dihydro-1,3-oxazoles
- Ring Synthesis 549 (5230), 621
- Ring Cleavage 549 (5230)
- 4,5-Dihydro-1,3-oxazoles
see also: Azlactones
- Ring Synthesis 317, 486 (5223), 832
- Ring Cleavage 250, 317, 336
- Ring Transformation 56, 250
● Oxete

- Oxetanes
- Ring Cleavage 862 (5330)
● Oxime Derivatives
- *O*-(Aminothiocarbonyl)-oximes
- Synthesis 815
● Oximes
- Reactions 815
- Regeneration of the Carbonyl Compound 212
- Aldoximes
- Synthesis 58
- Cyclization Reactions 58
- Reactions without Cyclization 702, 703, 905
- Ketoximes
- Reactions involving Ring Transformation 932
- Regeneration of the Ketones 554 (5245)
- Oximinoalkanoic Esters
- Synthesis 410 (5199)
● Oxirene

- Ring Synthesis 33, 35, 58, 76 (5101), 275, 300, 409 (5196), 552 (5241), 625, 823, 944 (5376)
- Ring Cleavage 139, 221, 232 (5126), 235 (5137), 301, 390, 409 (5196), 528, 552 (5241), 707 (5278), 709 (5284), 862 (5330), 905
- Ring Transformation 58, 275, 430
● Oxysulfuranes
- Synthesis and Reactions 727

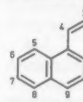
● Penams, Penicillins, and Relatives

Penam

- Synthesis 808
- Reactions 361, 711 (5290)
● 2,3,5,6,7-Pentaaza-1,4-diphosphabicyclo[2.2.1]heptane

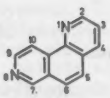
- Ring Synthesis 563
● Pentalene

- Pentalenes
- Ring Synthesis 181
- Octahydropentalenes
- Ring Synthesis 90, 861 (5327)
● Peptides
- Synthesis 474, 488 (5227), 544
- Dehydropeptides
- Synthesis 598
- Dipeptides
- Synthesis 600, 720, 915
- Polypeptides
- Synthesis 750
- *O,N*-Protected Peptides
- Reactions 76 (5103)
● Peroxy Compounds
see also: Carboperoxoic Acid Esters, Carboperoxoic Acids, Diacyl Peroxides, Hydroperoxy Compounds, Peroxylactones, etc.
- Alkyl Quinol Peroxides
- Synthesis 852
- Dialkyl Peroxides
- Synthesis 75 (5098)
- Heteroperoxy Compounds
- Reactions 75 (5098)
● Phanes
- [2.2]Metacyclophanes
- Synthesis 435
● Phenanthrene



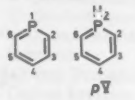
- Phenanthrenes
- Ring Synthesis 499
- 1,2,3,4,9,10-Hexahydrophenanthrenes
- Ring Synthesis 52
- 1,2,3,4,4a,9,10,10a-Octahydrophenanthrenes
- Ring Synthesis 798, 799
● Phenanthridine

- 5,6-Dihydrophenanthridines
- Ring Synthesis 503
- 1,2,3,4,5,6-Hexahydrophenanthridines
- Ring Synthesis 505
- 1,2,3,4,4a,5,6,10b-Octahydrophenanthridines
- Ring Synthesis 505, 507, 508
● 1,8-Phenanthroline



- 1,8-Phenanthrolin *N*-Oxides
- from Like Ring Skeletons 585
- 1,8-Phenanthrolinium Salts
- from Like Ring Skeletons 585
● Phenols
- Synthesis 234 (5132), 396, 627 (5263), 771, 825
- Reactions 617, 815, 862 (5330)
- *o,o'*-Alkylidenediphenols
- Synthesis 617
- 4-Aryloxyphenols
- Synthesis 399
- Halophenols
- Reactions 86
- Sterically Hindered Phenols
- Reactions 851
● Pheromones and Relatives
- Synthesis 388, 413
- Reactions 572
● Phosphine Oxides
- 1-Amino-1-alkenylphosphine Oxides
- Synthesis 265
- 1,2-Dihydroxyalkylphosphine Oxides and *O*-Derivatives
- Synthesis and Reactions 236 (5139)
- 1-Mercaptoalkylphosphine Oxides and *S*-Derivatives
- Reactions 940 (5362) (5363) (5364)
- Trialkylphosphine Oxides
- Synthesis 265
● Phosphines
- Dihalophosphines
- Reactions 479
- Triarylphosphines
- Reactions 265, 573, 588, 616
● Phosphine Sulfides
- 1-Amino-1-alkenylphosphine Sulfides
- Synthesis 265
● Phosphinic Acid Amides
- Synthesis 522
- Reactions 522, 787 (5303)
● Phosphinic Acids
- 1-Aminoalkylphosphinic Acids
- Synthesis 479
● Phosphinimines
● Phosphinous Acids
- Reactions 265
● Phosphonic Acid Diamides
- Reactions 35, 564, 682
● Phosphonic Acid Dihalides
- Reactions 265
● Phosphonic Acid Esters
- Alkanephosphonic Esters
- Synthesis 27, 310
- 1-Alkoxycarbonylalkanephosphonic Esters
- Synthesis 33
- 1-Aminoalkanephosphonic Esters
- Synthesis 522
- Carboxymethanephosphonic Esters and Derivatives
- Reactions 131, 133
- 1-Cyanoalkanephosphonic Esters
- Synthesis 310
- 1-Cyano-1-hydroxyalkanephosphonic Esters and *O*-Derivatives
- Reactions 161 (5110)
- 1,1-Dihaloalkanephosphonic Esters
- Reactions 27, 33
- 1,3-Dithian-2-phosphonic Esters
- Synthesis and Reactions 327 (5176)
- 1,2-Epoxyalkanephosphonic Esters
- Synthesis 33, 35
- Reactions 457
- 1-Haloalkanephosphonic Esters
- Reactions 27, 35, 682
- 1-Halo-2-oxoalkanephosphonic Esters

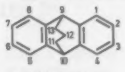
- Synthesis 29, 31
- Reactions 29, 31, 608
- 2-Oxoalkanephosphonic Diamides
- Synthesis 37, 457, 609, 682
- Reactions 609
- 1-Oxoalkanephosphonic Esters
- Reactions 609
- Silyl Phosphonates
- Synthesis 609
- 1-Thioureidoalkanephosphoric Esters
- Synthesis and Reactions 470
- Trichloromethanephosphonic Esters
- Reactions 29, 31
● Phosphonic Acids
- 1-Aminoalkanephosphonic Acids
- Synthesis 470, 479
- 1-Oxoalkanephosphonic Acids
- Synthesis and Reactions 609
● Phosphonitrile Dichloride
- Reactions 572
● Phosphonium Betaines
- Synthesis 265
● Phosphonium Salts
- 1,2-Alkenediyl-bis-phosphonium Salts
- Reactions 826
- Alkyltriarylphosphonium Salts
- Synthesis 616
- 1,3-Dithian-2-ylphosphonium Salts
- Synthesis and Reactions 327 (5176)
- 1-Hydroxyalkylphosphonium Salts and *O*-Derivatives
- Synthesis 588
- 2-Oxoalkylphosphonium Salts and *O*-Derivatives
- Synthesis and Reactions 826
- Polymer-Linked Phosphonium Salts
- Synthesis 315
● Phosphonoamidoselenoic Acid Esters
- Synthesis 584
● Phosphonoamidous Acid Esters
- Synthesis and Reactions 584
● Phosphonohydrazidic Acid Esters
- Synthesis 564
● Phosphonothioic Acid Esters
- Alkanephosphonothioic Esters
- Reactions 37
- 1,2-Epoxyalkanephosphonothioic Esters
- Synthesis 35
- 1-Haloalkanephosphonothioic Esters
- Reactions 35, 682
- 2-Oxoalkanephosphonothioic Esters
- Synthesis 682
● Phosphonous Acid Diamides
- Reactions 562
● Phosphonous Acid Esters
- Reactions 527
● Phosphoranes
- Alkylidenephosphoranes
for Reactions of Alkylidenephosphoranes and Derivatives thereof, *refer also to* REACTION INDEX, Carbonyl Olefination
- Reactions 266, 653
- 1,3-Dithian-2-ylidenephosphoranes
- Synthesis and Reactions 327 (5176)
- 1-Hydroxyalkylidenephosphoranes and *O*-Derivatives
- Reactions 67
- 2-Oxoalkylidenephosphoranes
- Reactions 432
● Phosphoric Acid Esters
- 1,2-Alkadienyl Phosphates
- Synthesis 791 (5314)
- 1-Alkenyl Phosphates
- Synthesis and Reactions 72 (5091)
- Alkyl Dihydrogen Phosphates
- Synthesis 770
- 2-Alkynyl Phosphates
- Reactions 791 (5314)
- Aryl Dialkyl Phosphates
- Synthesis 602
- Aryl Dihydrogen Phosphates
- Synthesis and Reactions 602
- Dialkyl Hydrogen Phosphates
- Reactions 770
- Trialkyl Phosphates
- Synthesis and Reactions 327 (5177)
● Phosphoric Acid Hydrazides
- Reactions 568
● Phosphorin



pV

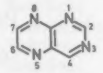
- P^{V}-Phosphorin
- Reactions with Retention of the Ring Skeleton 846
● Phosphoroamidic Acid Esters
- Alkyl Silyl Phosphoroamidates
- Synthesis 777
- Diesters
- Reactions 777
- Disilyl Phosphoroamidates
- Synthesis 777
● Phosphoroamidoselenoic Acid Esters
- Synthesis 584
● Phosphoroamidous Acid Esters
- Synthesis and Reactions 584
● Phosphorobromidic Acid Esters
- Synthesis 474
- Reactions 777
- Silyl Phosphorobromidates
- Synthesis 777
● Phosphorochloridic Acid Esters
- Reactions 310, 602, 777
- Silyl Phosphorochloridates
- Synthesis 777
● Phosphorodichloridous Acid Esters
- Reactions 559, 561
● Phosphoroimidous Amides
- Reactions 569
● Phosphoroselenoic Acid Esters
- *O,O,O*-Triesters
- Synthesis 584
● Phosphorothioic Acid Esters
- *O,O,S*-Triesters
- Reactions 777
● Phosphorous Acid Esters
- Synthesis and Reactions 584
- Alkyl Hydrogen Metal Phosphites
- Synthesis and Reactions 135
- Dialkyl Hydrogen Phosphites
- Reactions 133, 134, 457, 522
- Trialkyl Phosphites
- Reactions 45, 470, 474, 483 (5215), 527
● Phosphorous Acid Triamides
- Reactions 265, 559, 562, 563
● Phthalazine

- 1,2-Dihydrophthalazines
- Anellation Reactions 206
- 1,2,3,4-Tetrahydrophthalazines
- from Like Ring Skeletons 447
- Ring Transformation 877
● Polycarboxylic Acid Esters
- Bi-cyclopentadienyl-decacarboxylic Esters
- Synthesis 472
- 1,6-Hexadiene-1,1,3,3,4,4,6,6-octacarboxylic Esters
- Synthesis 472
● Polyenes (conjugated)
- Synthesis 173, 179, 263, 733
- Reactions without Cyclization 161 (5112)
● Polyketones
- Cyclic Polyketones
- Reactions 192
- *vic*-Tetrones
- Synthesis 723
● Polynitriles
- Synthesis 277
- 2-Cyanomethyltetracyanopropene
- Synthesis 175
- Hexacyanopentadienide Salts
- Synthesis 257
- Malodinitrile Dimers and Trimers
- Synthesis and Reactions 170
- Polycyanoarenes
- Synthesis 258
- Tetracyano-2-azapropenide Salts
- Synthesis and Reactions 258, 259
- Tetracyanoethylene
- Reactions 114, 126, 255, 256, 271, 922
- Tetracyanooxirane
- Reactions 384
● 9,10-Propanoanthracene

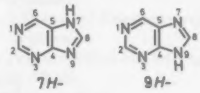


9,10-Dihydro-

- 9,10-Dihydro-9,10-propanoanthracenes
- Ring Synthesis 902
● Prostaglandine Precursors
- Synthesis 468
● Pteridine

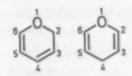


- Ring Synthesis 249
● Purine



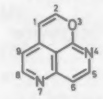
7*H*- 9*H*-

- Ring Synthesis 251
● Pyran

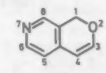


2*H*- 4*H*-

- 4*H*-Pyrans
- Ring Synthesis 273
- 4-Alkylidenepyrans
- Anellation Reactions and Ring Transformation 244
- 3,4-Dihydro-2*H*-pyrans
- Ring Synthesis 210, 272
- Reactions with Retention of the Ring Skeleton 792 (5318)
- Ring Transformation 900
- 5,6-Dihydro-2*H*-pyrans
- Ring Synthesis 553 (5244)
● Pyrano[4,3,2-*de*][1,6]naphthyridine



- Ring Synthesis 244
● Pyrano[3,4-*c*]pyridine

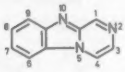


1*H*-

- 7,8-Dihydro-1*H*-pyrano[3,4-*c*]pyridines
- Ring Synthesis 245
● Pyrazine

- Pyrazines
- Ring Synthesis 373
- Anellation Reactions 249
- Ring Transformation 254
- Pyrazine *N*-Oxides
- Ring Synthesis 249
- Pyrazinium Ylides
- Reactions 207
- 1,2,3,6-Tetrahydropyrazines
- Ring Synthesis 317
- Hexahydropyrazines
- Ring Synthesis 911

● Pyrazino[1,2-*a*]benzimidazole



- 4,10-Dihydropyrazino[1,2-*a*]benzimidazoles
- Ring Synthesis 313

● Pyrazole

3*H*- 4*H*-

- Pyrazoles
- Ring Synthesis 60, 448, 481 (5207), 699, 900
- 3*H*-Pyrazoles
- Ring Transformation 100
- 4,5-Dihydropyrazoles
- Ring Synthesis 60

● Pyrazolo[3,4-*b*]pyridine

1*H*-

- Ring Synthesis 640

● Pyridine

- Pyridines
- from Like Ring Skeletons 844
- Ring Synthesis 171, 191, 252, 254, 275
- Anellation Reactions 272, 640
- Pyridine *N*-Oxides
- Reactions with Retention of the Ring Skeleton 209
- Pyridinium Ylides
- Reactions 207, 273
- 1,2-Dihydropyridines
- Ring Synthesis 172, 176, 177, 182, 262, 461
- Anellation Reactions 509
- 1,4-Dihydropyridines
- from Like Ring Skeletons 587
- Ring Synthesis 244
- Anellation Reactions 245
- 1-Acyl-4-benzylidene-1,4-dihydropyridines
- Reactions 899
- 2-Pyridones

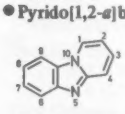
see also: 1,2-Dihydropyridines

- Synthesis 681
- Reactions with Retention of the Ring Skeleton 844
- 4-Pyridones

see also: 1,4-Dihydropyridines

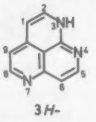
- Reactions with Retention of the Ring Skeleton 844

● Pyrido[1,2-*a*]benzimidazole



- Pyrido[1,2-*a*]benzimidazoles
- from Like Ring Skeletons 451
- 3,4-Dihydropyrido[1,2-*a*]benzimidazoles
- Ring Synthesis 451
- 1,2,3,4-Tetrahydropyrido[1,2-*a*]benzimidazoles
- Ring Synthesis 451

● Pyrido[4,3,2-*de*][1,6]naphthyridine



3*H*-

- Ring Synthesis 245

● Pyrido[2,3-*b*]pyrazine

- 5,6,7,8-Tetrahydropyrido[2,3-*b*]pyrazines
- Ring Synthesis 507

● Pyrido[1,2-*a*]pyrimidine

4*H*-

- Ring Synthesis 272

● Pyrido[2,3-*d*]pyrimidine

- Pyrido[2,3-*d*]pyrimidine 3-Oxides
- Ring Transformation 253
- 5,6,7,8-Tetrahydropyrido[2,3-*d*]pyrimidines
- Ring Synthesis 507

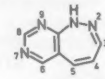
● Pyrido[3,2-*d*]pyrimidine

- 5,6,7,8-Tetrahydropyrido[3,2-*d*]pyrimidines
- Ring Synthesis 507

● Pyrimidine

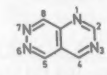
- Pyrimidines
- Ring Synthesis 40, 252
- Pyrimidine *N*-Oxides
- Ring Synthesis 673
- 2,5-Dihydropyrimidines
- Ring Synthesis 40
- 1,2,3,4-Tetrahydropyrimidines
- Anellation Reactions 748
- Hexahydropyrimidines
- Ring Synthesis 273

● Pyrimido[4,5-*c*][1,2]diazepine



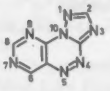
- 6,7,8,9-Tetrahydro-1*H*-pyrimido[4,5-*c*][1,2]diazepines
- Ring Synthesis 748

● Pyrimido[4,5-*d*]pyridazine



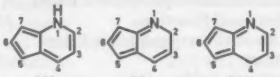
- 1,2,3,4,7,8-Hexahydropyrimido-[4,5-*d*]pyridazines
- Ring Synthesis 464

● Pyrimido[4,5-*e*][1,2,4]triazolo-[3,2-*c*][1,2,4]triazine

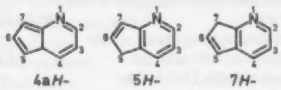


- Ring Synthesis 273

● 1-Pyrindine



1*H*- 2*H*- 4*H*-



4a*H*- 5*H*- 7*H*-

- 5*H*-1-Pyrindines
- Ring Synthesis 181
- 4a,7-Dihydro-2*H*-1-pyrindines
- Ring Synthesis 273

● 2-Pyrones

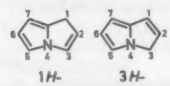
- from Like Ring Skeletons 145

● Pyrrole

2*H*- 3*H*-

- Pyrroles
- Ring Synthesis 252, 487 (5225), 591, 687
- 2,3-Dihydropyrroles
- Ring Synthesis 173, 250, 282, 292
- 2,5-Dihydropyrroles
- Ring Synthesis 687
- Pyrrolidines
- Ring Synthesis 266, 291, 685, 725

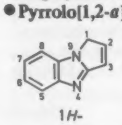
● Pyrrolizine



1*H*- 3*H*-

- 2,3-Dihydro-1*H*-pyrrolizines
- Ring Synthesis 173
- Pyrrolizidines
- from Like Ring Skeletons 701
- 4(8)-Dehydropyrrolizidinium Salts
- Ring Synthesis 701

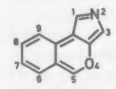
● Pyrrolo[1,2-*a*]benzimidazole



1*H*-

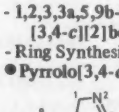
- Ring Synthesis 665

● Pyrrolo[3,4-*c*][2]benzopyran



- 1,2,3,3a,5,9b-Hexahydropyrrolo-[3,4-*c*][2]benzopyrans
- Ring Synthesis 798

● Pyrrolo[3,4-*c*]isoquinoline

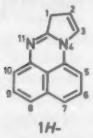


1*H*-

- 2,3,4,5-Tetrahydro-1*H*-pyrrolo-[3,4-*c*]isoquinolines
- Ring Synthesis 798
- 2,3,3a,4,5,9b-Hexahydro-1*H*-pyrrolo-[3,4-*c*]isoquinolines
- Ring Synthesis 798
● Pyrrolo[2,1-*c*][1,4]oxazine

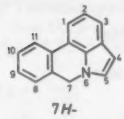
1*H*-

- Hexahydropyrrolo[2,1-*c*][1,4]oxazines
- Ring Synthesis and Cleavage 325 (5172)
● Pyrrolo[1,2-*a*]perimidine



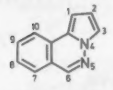
1*H*-

- 10*H*-Pyrrolo[1,2-*a*]perimidines
- Ring Synthesis 665
● Pyrrolo[3,2,1-*de*]phenanthridine



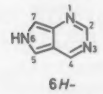
7*H*-

- 4,5-Dihydro-7*H*-pyrrolo-[3,2,1-*de*]phenanthridines
- Ring Synthesis 516
- 1,2,3,3a,4,5-Hexahydro-7*H*-pyrrolo-[3,2,1-*de*]phenanthridines
- Ring Synthesis 516
● Pyrrolo[2,1-*a*]phthalazine



- Ring Synthesis 206
● Pyrrolo[1,2-*a*]pyrazine

- Ring Synthesis 208
● Pyrrolo[3,4-*d*]pyrimidine



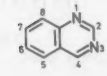
6*H*-

- 1,2,3,4-Tetrahydro-6*H*-pyrrolo-[3,4-*d*]pyrimidines
- Ring Synthesis 464
● Pyrrolo[2,3-*b*]pyrrole

- Octahydropyrrolo[2,3-*b*]pyrroles
- Ring Synthesis 180
● Pyrrolo[3,2-*b*]pyrrole

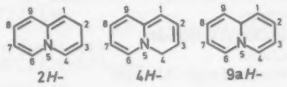
- Octahydropyrrolo[3,2-*b*]pyrroles
- Ring Synthesis 180

● Quinazoline



- Quinazolines
- Ring Transformation 253
- 1,2-Dihydroquinazolines
- Ring Synthesis 379, 760
- 3,4-Dihydroquinazolines
- Ring Synthesis 524, 619
- Ring Cleavage 619
- 1,2,3,4-Tetrahydroquinazolines
- Ring Synthesis 808
● *o*-Quinodimethanes
- Cyclization Reactions 793
● *p*-Quinodimethanes
- Synthesis 241
● Quinol Derivatives
- Quinol Acylates
- Synthesis 852
- Quinol Amides
- Synthesis 852
- Quinol Ethers
- Synthesis and Reactions 852
- Quinol Peroxides
- Synthesis 852
● Quinoline

- Quinolines
- Ring Synthesis 253, 276, 698
- Anellation Reactions 855
- Reactions with Retention of the Ring Skeleton 447
- Quinoline *N*-Oxides
- Anellation Reactions 275
- 1,2-Dihydroquinolines
- from Like Ring Skeletons 810
- Ring Synthesis 273
- 2-Quinolones
- Anellation Reactions 855
- 1,2,3,4-Tetrahydroquinolines
- from Like Ring Skeletons 447
- Ring Synthesis 506
- 1,2,5,6,7,8-Hexahydroquinolines
- Ring Synthesis 184
● Quinolizine



2*H*- 4*H*- 9a*H*-

- 2*H*-Quinolizines
- Ring Synthesis 273
- 4*H*-Quinolizines
- Ring Synthesis 207
- 9a*H*-Quinolizines
- Ring Synthesis 207
● Quinols
- Synthesis 852
● Quinone Diimines
see: Imines
● Quinones
- Acenaphthylenequinones
- Reactions 204
- Anthraquinones
- Reactions 203
- *p*-Benzoquinones
- Anellation Reactions 201, 437
- Diphenoquinones
- Reactions 202
- 1,4-Naphthoquinones
- Anellation Reactions 938 (5355)
- Phenanthrenequinones
- Reactions 203, 204
- Polycyclic Quinones
- Reactions 204
- Tetracenequinones
- Synthesis 938 (5355)
- Tryptycenequinones
- Synthesis 438

● Quinoxaline

- Ring Synthesis 373, 664

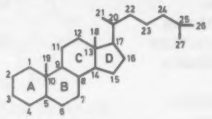
● Reductones
- Synthesis 195
● Reissert Compounds
- Reactions 206
● Rhodizonic Acid and Derivatives
- Reactions 198

● (*S*)-Salsolidine
- Synthesis 335
● 1,2,3-Selenadiazole

- Ring Synthesis 597
- Ring Cleavage 536
● 1,2,4-Selenadiazole

- Ring Synthesis 769
● Selenenic Acid Halides
- Reactions 792 (5319)
● Selenocarboxylic Acid Amides
- Synthesis 668
- Reactions 769
● Selenocyanates
- Bis[selenocyanato]-alkanes
- Synthesis 152
- 2-Haloalkyl Selenocyanates
- Synthesis 152
- Perfluoroalkyl Selenocyanates
- Synthesis 836
● Selenoethers
- 1-Alkenyl Aryl Selenides
- Reactions 707 (5279)
- Alkyl Aryl Selenides
- Synthesis 418, 707 (5279), 860 (5323), 864 (5337), 942 (5369)
- Reactions 707 (5279), 860 (5323), 864 (5337)
- α-Arylselenylcarboxylic Acid Derivatives
- Reactions 476
- Alkyl(Aryl)selenyl-*O*-heterocyclic Compounds
- Synthesis and Reactions 476
- 2-Hydroxyalkyl Selenides and *O*-Derivatives
- Synthesis 862 (5330)
- Reactions 710 (5287)
● Selenols
- Reactions 862 (5330)
- Areneselenols
- Reactions 836, 860 (5323), 864 (5337), 942 (5369)
● Selenoxides
- Aryl Perfluoroalkyl Selenoxides
- Synthesis 836
● Semiacetals and Derivatives
- *O,S*-Semiacetal *O*-Acylates
- Synthesis 209, 629 (5267)
- Reactions 209
- *S,S*-Semiacetal Thiocarbamates
- Synthesis 321 (5159)
● Semicarbazides
- *N''*-Acylsemicarbazides
- Cyclization Reactions 562
● Semicarbazones
- Ketone Semicarbazones
- Synthesis and Cyclization Reactions 597
- Monosemicarbazones of *vic*-Dicarbonyl Compounds
- Reactions without Cyclization 535

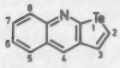
● Silanes
- Acylsilanes
- Synthesis and Reactions 556 (5251)
- 1-Alkenylsilanes
- Synthesis 73 (5093), 325 (5170), 707 (5280)
- Reactions 551 (5236), 629 (5269), 861 (5329)
- Alkylthiotrialkylsilanes
- Reactions 239 (5149), 325 (5170)
- 1-Alkynylsilanes
- Reactions 707 (5280)
- Aryldialkylsilanes
- Reactions 487 (5224)
- Arylsulfenyloxysilanes
- Synthesis and Reactions 720
- Arylthiotrialkylsilanes
- Reactions 325 (5170)
- Aryltrialkylsilanes
- Reactions 755
- Azidotrialkylsilanes
- Reactions 553 (5242)
- Cyanotrialkylsilanes
- Synthesis 154, 755
- *in situ* Generation and Reactions 219
- Dialkyldicyanosilanes
- Synthesis 154
- Dialkyldihalosilanes
- Reactions 154
- Disilylacetylenes
- Reactions 798
- 1-Haloalkylsilanes
- Reactions 552 (5240)
- Halotrialkylsilanes
- Reactions 154, 588, 625 (5255)
- 3-Hydroxy-2-silyl-1-alkenes and *O*-Derivatives
- Reactions 73 (5092)
- 1-Siloxy-1-alkenylsilanes
- Reactions 556 (5251)
- 2-Silyl-1,3-dithia Compounds
- Synthesis and Reactions 483 (5213)
- Silyloxiranes
- Synthesis 625 (5255)
- Reactions 552 (5241), 625 (5255)
- Trialkylsilanes
- Reactions 487 (5224)
● Silyl Esters
- Silyl Carboxylates
- Synthesis 755
- Silyl Phosphonates
- Synthesis 609
- Silyl Phosphoroamidates
- Synthesis 777
- Silyl Phosphorobromidates
- Synthesis 777
- Silyl Phosphorochloridates
- Synthesis 777
- Silyl Sulfonates
- Synthesis 755
● Silyl Ethers
- Synthesis 550 (5233)
- 1,3-Alkadienyl Silyl Ethers
- Reactions 788 (5306)
- 1-Alkenyl Silyl Ethers (Enol Silyl Ethers)
- Synthesis 164 (5122), 859 (5320), 934
- Reactions 237 (5141), 487 (5224), 556 (5251), 589, 859 (5320), 934
- Enediol Silyl Ethers
- Reactions 863 (5335), 879
- *O*-Silylcyanohydrins
- Synthesis 219
● Spiro Compounds
- Carbocyclic Spiro Compounds
- Synthesis 77, 187, 728, 786 (5301)
- Heterocyclic Spiro Compounds
- Synthesis 68, 539, 575, 798
● Squaric Acid and Derivatives
- Synthesis 831, 869
- Reactions 194, 831
● Stannanes
- 2-Hydroxyalkylstannanes
- Synthesis and Reactions 859 (5322)
- 2-Stannyl-1,3-dithia Compounds
- Synthesis and Reactions 483 (5213)
- Tetraalkylstannanes
- Synthesis and Reactions 788 (5307)
- Trialkylstannyllithium
- Reactions 788 (5307)
● Steroids and Relatives



- 3,11-Dioxosteroids
- Reactions 555 (5250)
- 3,17-Dioxosteroids
- Synthesis 488 (5229)
- Estratrienes
- Synthesis 801
- D-Homosteroids
- Synthesis 800
- 11-Hydroxy-3-oxosteroids
- Synthesis 555 (5250)
- 11-Oxoestrones
- Synthesis 801
- 16a-Substituted 16-Aminomethylene-17-oxosteroids
- Reactions 274
● Stilbenes
- Synthesis 616, 902
- Reactions 499
● Streptose
- Synthesis 718
● Styrenes
- Reactions 238 (5144)
● Sugar Alcohols and *O*-Derivatives
- Reactions 688, 696
● Sulfamic Acid Esters
- Synthesis 357
● Sulfenic Acid Amides
- Synthesis 710 (5288)
- Reactions 163 (5118), 271, 710 (5288)
● Sulfenic Acid Halides
- Alkoxycarbonylsulfenyl Chlorides
- Reactions 943 (5372)
- Arylsulfenyl Chlorides
- Reactions 328 (5179), 721
- α-Chlorosulfenyl Chlorides
- Reactions 710 (5288)
- Trichloromethylsulfenyl Chloride
- Reactions 804
● Sulfenic Acids
- Synthesis 720
● Sulfenic Acid Silyl Esters
- Synthesis and Reactions 720
● Sulfilimines
- Synthesis 727
- Reactions 540, 734
● Sulfines
- Synthesis 739
- Dichlorosulfine
- Synthesis 820
● Sulfinic Acid Amides
- Synthesis 163 (5118), 730
- Reactions 441, 730
● Sulfinic Acid Esters
- Synthesis 441, 729
- Reactions 730
● Sulfinic Acids
- Synthesis 729
- Reactions 53, 441, 816
● Sulfone Diimines
- Synthesis 734
● Sulfones
- Synthesis 300
- Reactions 731–733
- 1-Alkenyl Sulfones
- Synthesis and Reactions 321 (5158), 732
- 2-Alkenyl Sulfones
- Synthesis and Reactions 321 (5158)
- Alkyl Aryl Sulfones
- Reactions 74 (5095), 731
- Alkyl Trifluoromethyl Sulfones
- Reactions 483 (5215)
- 1-Amino-1-alkenyl Sulfones
- Synthesis and Reactions 733
- Aryl Cyclobutenyl Sulfones
- Synthesis 658
- Cyclic Sulfones
- Synthesis 214
- Reactions 211, 214, 733
- Cyclopropyl Sulfones
- Synthesis 943 (5373)
- 2,3-Epoxyalkyl Sulfones
- Reactions 866 (5343)
- 1-Haloalkyl Sulfones
- Synthesis and Reactions 883
- 1-Halo-2-oxoalkyl Sulfones
- Reactions 604
- 2-Oxoalkyl Sulfones
- Synthesis 323 (5165)
● Sulfonic Acid Amides
- 1-Alkenesulfonamides
- Synthesis 823
- Arenesulfonamides
- Synthesis 65
- 1,1-Dihaloalkanesulfonamides
- Synthesis and Reactions 823
- 1,2-Epoxyalkanesulfonamides
- Synthesis 823
- 1-Haloalkanesulfonamides
- Synthesis and Reactions 823
● Sulfonic Acid Azides
- Reactions 65
● Sulfonic Acid Esters
- Alkanesulfonic Esters
- Reactions 71 (5086)
- Trifluoromethanesulfonic Esters
- Reactions 75 (5098)
● Sulfonic Acid Imides
- Reactions 736
● Sulfonic Acids
- Trifluoromethanesulfonic Acid (Triflic Acid)
- Reactions 735
● Sulfonium Salts
- Synthesis 727
- α-Sulfoniocarboxylic Acid Derivatives
- Synthesis and Reactions 710 (5289)
● Sulfonothioic Acid Esters
- Synthesis 712 (5293), 737, 816
● Sulfoxides
- Synthesis 163 (5118), 758
- Reactions 137, 138, 542, 727
- 2-Alkenyl Aryl Sulfoxides
- Synthesis 726
- Alkyl Aryl Sulfoxides
- Synthesis 723
- Reactions 724, 881
- Cepham and Penam *S*-Oxides
- Synthesis 361
- Dialkyl Sulfoxides
- Synthesis 209
- Reactions 209, 678
- 1,2-Epoxyalkyl Sulfoxides
- Synthesis and Reactions 409 (5196)
- 1-Haloalkyl Sulfoxides
- Synthesis 724
- Reactions 409 (5196)
- 1-Mercaptoalkyl Sulfoxides and *S*-Derivatives
- Reactions 555 (5248)
- 2-Oxoalkyl Sulfoxides
- Synthesis 730
- Reactions 373
- α-Sulfinylcarboxylic Acid Derivatives
- Reactions 163 (5117)
- Thiirane *S*-Oxides
- Reactions 739

● Sulfoximines
- Reactions 734
● Sulfuranes
- Synthesis 678, 710 (5289)
- Reactions 265, 481 (5209), 653, 710 (5289)
● Sultines (Cyclic Sulfinic Acid Esters)
- Reactions 579, 730

● Tellurolo[2,3-*b*]quinoline



- from Like Ring Skeletons 842
● Terpenes
- Monoterpenes
- Synthesis 147, 345
- Reactions 146, 147, 754
- Sesquiterpenes
- Synthesis and Reactions 225
- Tetraterpenes
- Reactions 605
- Triterpenes
- Synthesis 802
● Tetraalkoxyethylenes
- Reactions 7, 13, 250, 938 (5355)
● 1,2,4,5,3,6-Tetraazadiphosphorin

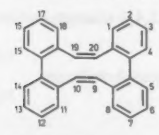
- Hexahydro-1,2,4,5,3,6-tetraazadiphosphorins
- Ring Synthesis 563, 568
● 1,2,4,5-Tetraaza-3-phosphabicyclo-[1.1.1]pentane

- P^V-1,2,4,5-Tetraaza-3-phospha-bicyclo[1.1.1]-3-pentenes
- Ring Synthesis 569
● 1,2,4,5,3-Tetraazaphosphepin

- 3,4-Dihydro-2*H*-1,2,4,5,3-tetraazaphos-phepins
- Ring Synthesis 569
- Hexahydro-1,2,4,5,3-tetraazaphosphepins
- Ring Synthesis 563
● Tetraazaphosphole

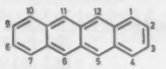
- 4,5-Dihydrotetraazaphospholes
- Ring Synthesis 576
● 1,2,4,5,3-Tetraazaphosphorin

- Hexahydro-1,2,4,5,3-tetraazaphosphorins
- Ring Synthesis 568
● Tetrabenzo[*a,c,g,i*]cyclododecene



- Ring Synthesis 733

● Tetracene (Naphthacene)



- 1,2,3,4,5,5a,6,11,11a, 12-Decahydro-tetracenes
- Ring Synthesis 938 (5355)
● Tetracyanoethylene
see: Polynitriles
● Tetrathiafulvalenes
- Reactions 281
● 1,3,4,6-Tetrathiapentalenes

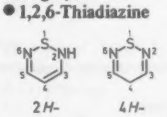
- Ring Synthesis 816
● Tetrazole

- Ring Synthesis 814
- Ring Transformation 808
● 2-Thiabicyclo[2.2.1]heptane

- 2-Thiabicyclo[2.2.1]hept-5-enes
- Ring Synthesis 817
● 2-Thiabicyclo[2.2.2]octane

- 2-Thiabicyclo[2.2.2]oct-5-enes
- Ring Synthesis 817
● Thiacoumarins
see: 1-Benzothiapyrans
● 1,3,4,2,5-Thiadiazadiphosphole

- Tetrahydro-1,3,4,2,5-thiadiazadiphosphole
- Ring Synthesis 562
● 1,2,6-Thiadiazine

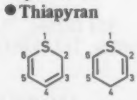


2*H*- 4*H*-

- Ring Synthesis 262
● 1,2,3-Thiadiazole

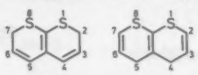
- Ring Synthesis 813
- Ring Cleavage 536
● 1,3,4-Thiadiazole

- 1,3,4-Thiadiazoles
- Ring Synthesis 808, 814
- 2,3-Dihydro-1,3,4-thiadiazoles
- Ring Synthesis 812
- Tetrahydro-1,3,4-thiadiazoles
- Ring Synthesis 812
● Thialactones
- Synthesis 228
● Thiapyran



2*H*- 4*H*-

- 2*H*-Thiapyrans
- Ring Synthesis 173
- Anellation Reactions 578
- Thia-2-pyrones and Derivatives
- Ring Synthesis 260
- Thiapyryllium Salts
- Ring Synthesis 817
- Thiapyranone 1,1-Dioxides
- Ring Transformation 211
- 3,4-Dihydro-2*H*-thiapyrans
- Ring Synthesis 228
- 3,4-Dihydro-2*H*-thiapyran 1,1-Dioxides
- Synthesis and Ring Transformation 211
● Thiapyrano[2,3-*b*]thiapyran



2*H*,7*H*- 4*H*,5*H*-

- Ring Synthesis 578
● 1,2,4-Thiaselenazole

3*H*-

- Ring Synthesis 44
- Ring Transformation 45
● 7-Thia-2,3,5,6-tetraaza-1,4-diphospha-bicyclo[2.2.1]heptane

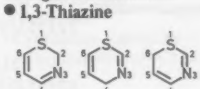
- Ring Synthesis 563
● 1,2,3,4-Thiatriazole

- Ring Synthesis 814, 815
● 1,4,2-Thiazaphosphole

- 2,3-Dihydro-P^V-1,4,2-thiazaphospholes
- Ring Synthesis 45
● 1,4-Thiazepine

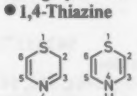
- 2,3,4,5-Tetrahydro-1,4-thiazepines
- Ring Synthesis 211
● 1,3-Thiazete

- Ring Transformation 44
● 1,3-Thiazine



2*H*- 4*H*- 6*H*-

- Ring Synthesis 45
● 1,4-Thiazine



2*H*- 4*H*-

- 3,4-Dihydro-2*H*-1,4-thiazines
- Ring Synthesis 745
- Tetrahydro-1,4-thiazines
- Ring Synthesis 911

● 1,3-Thiazole

- 1,3-Thiazoles
- Ring Synthesis 275
- Tetrahydro-1,3-thiazoles
- *N*-Acylation and Ring Cleavage 941 (5366)
- Tetrahydro-1,3-thiazole 1-Oxides
- Ring Transformation 745

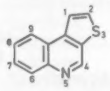
● 1,3-Thiazolo[3,2-*b*][1,2,4]triazole

- Ring Synthesis 289

● Thieno[3,4-*b*][1,4]dioxin

- 2,3-Dihydrothieno[3,4-*b*][1,4]dioxins
- Ring Synthesis and Cleavage 622

● Thieno[2,3-*b*]quinoline



- 4,5-Dihydrothieno[2,3-*c*]quinolines
- Ring Synthesis 508

● Thieno[2,3-*b*]thiapyrans

6*H*-

- Anellation Reactions 578

● Thiete

- Thietanes
- Ring Synthesis 818
- Thietane 1,1-Dioxides
- Ring Synthesis and Transformation 579

● Thiirene

- Thiiranes
- Ring Synthesis 738, 818
- Ring Cleavage 738
- Thiirane *S*-Oxides
- Ring Cleavage 739

● Thiobiurets
- Synthesis 776

● Thiocarbamic Acid Chlorides
- Synthesis 804

● Thiocarbamic Acid Esters
- *S*-(2-Alkenyl) Thiocarbamates
- Synthesis 321 (5159)
- *O*-Esters
- Synthesis 814
- Reactions 625 (5257)

● Thiocarbonic Acid Esters
- *O,O*-Diesters
- Synthesis 814
- *O,S*-Diesters
- Synthesis and Reactions 943 (5372)

● Thiocarboxylic Acid Amides
- Synthesis 554 (5246), 716, 917
- Reactions without Cyclization 711 (5292)
- *N*-(1-Hydroxyalkyl)-thiocarboxamides and *O*-Derivatives
- Cyclization Reactions 443

● Thiocarboxylic Acid Esters
- *S*-Esters, General
- Synthesis 411 (5203), 544, 715, 943 (5374)
- 2-Alkylthio-2-aminoalkanethioic *S*-Esters
- Synthesis 865 (5339)
- Reactions 865 (5340)
- 2-Haloalkanethioic *S*-Esters
- Reactions 710 (5289)
- 2-Oxoalkanethioic *S*-Esters
- Synthesis 710 (5289), 865 (5339)

● Thiocarboxylic Acid Hydrazides
- Cyclization Reactions 812

● Thiocarboxylic Acids
- Synthesis 717

● Thiocyanates
- Alkyl Thiocyanates
- Synthesis 577, 868 (5350)
- Perfluoroalkyl Thiocyanates
- Synthesis 836

● Thiodiphosphoric Acid Esters
- Synthesis and Reactions 777

● Thioethers
- Synthesis 137, 138, 540, 542, 654, 712 (5293), 721, 944 (5375)
- Reactions 163 (5118), 300, 758
- 1-Alkenyl 1-Alkynyl Sulfides
- Synthesis 577
- 2-Alkenyl-2-Aminoalkyl Sulfides
- Synthesis 914
- 1-Alkenyl Aryl Sulfides
- Reactions 721
- 1-Alkenyl Sulfides
- Synthesis 240 (5150), 285, 577, 940 (5362) (5363)
- Reactions 160 (5107), 940 (5362) (5363)
- 3-Alkenyl Sulfides
- Synthesis 359
- 3-Alkoxy-1-alkenyl Sulfides
- Synthesis 235 (5137)
- Reactions 235 (5137), 237 (5142), 320 (5156)
- 3-Alkoxy 2-Alkenyl Sulfides
- Synthesis 235 (5137), 237 (5142)
- Reactions 237 (5142)
- Alkyl Aryl Sulfides
- Synthesis 56, 316, 322 (5161), 785 (5299)
- Reactions 56, 58, 310, 322 (5161)
- 1-Alkynyl Sulfides
- Reactions 285
- 2-Alkynyl Sulfides
- Synthesis 289
- *C*-(2-Alkynylthio)-*S*-heterocyclic Compound Compounds
- Synthesis and Reactions 578
- Aryl Cyclobutenyl Sulfides
- Synthesis 659
- Aryl Perfluoroalkyl Sulfides
- Synthesis 836
- *C*-Arylthio-*N*-heterocyclic Compounds
- Synthesis 380
- Bis[2-alkenyl]Sulfides
- Reactions 911
- 1,3-Bis[arylthio]-1-alkenes
- Synthesis and Reactions 940 (5364)
- Chloromethyl Sulfides
- Synthesis 868 (5351)
- Dialkyl Sulfides
- Reactions 710 (5289)
- 2-Haloalkyl Sulfides
- Synthesis and Reactions 577
- 2-Hydroxyalkyl Sulfides and *O*-Derivatives
- Reactions 710 (5287)

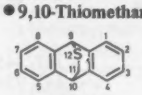
● Thioketenes
- Synthesis 817

● Thioketones
- Synthesis 554 (5246), 722
- Reactions without Cyclization 711 (5292), 722

● Thiolactams
- Synthesis 554 (5246)

● Thiols (Mercaptans)
- Synthesis 717, 714
- Reactions 50, 53, 164 (5120), 670, 712 (5293), 714, 729, 816, 862 (5330)
- Alkanethiols
- Synthesis 75 (5100)
- Cyclization Reactions 482 (5212)
- Reactions without Cyclization 240 (5150), 359
- Arenethiols
- Reactions 836, 868 (5351), 943 (5372)
- Mercaptocyclobutenediones
- Synthesis 19, 654
- *C*-Mercapto-*N*-heterocyclic Compounds
- Reactions 289, 868 (5351)

● 9,10-Thiomethanoanthracene



9,10-Dihydro-

- 9,10-Dihydro-9,10-thiomethanoanthracenes
- Ring Synthesis 817

● Thiophene

- Thiophenes
- from Like Ring Skeletons 368
- Ring Synthesis 261, 275
- Anellation Reactions 264
- Reactions with Retention of the Ring Skeleton 160 (5109)
- 2,3-Dihydrothiophenes
- from Like Ring Skeletons 368
- 2,3-Dihydrothiophene 1,1-Dioxides
- Ring Synthesis 211
- Anellation Reactions 622
- Tetrahydrothiophenes
- Ring Synthesis 368

● Thiosulfonic Acid Esters
see: Sulfonothioic Acid Esters

● Thioureas
see also: Cyanothioureas
- Synthesis 804, 808
- Reactions without Cyclization 164 (5119), 470

● 1,2,4,3,5-Triazadiphosphole

- Tetrahydro-1,2,4,3,5-triazadiphospholes
- Ring Synthesis 562

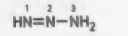
● 1,2,4,3-Triazaphosphole

- Ring Synthesis 559
- 2*H*-1,2,4,3-Triazaphospholes
- Ring Synthesis 559, 560
- 2,3-Dihydro-1*H*-1,2,4,3-triazaphospholes
- Ring Synthesis 561
- 3,4-Dihydro-2*H*-1,2,4,3-triazaphospholes
- Ring Synthesis 565

● 1,2,4,3-Triazaphosphorin

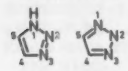
- 2,3,4,5-Tetrahydro-1,2,4,3-triazaphosphorins
- Ring Synthesis 567
- Hexahydro-1,2,4,3-triazaphosphorins
- Ring Synthesis 562

● Triazenes



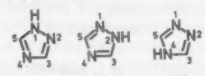
- Synthesis and Reactions 921
● 1,3,5-Triazine

- 1,3,5-Triazines
- Ring Synthesis 40
- 1,4-Dihydro-1,3,5-triazines
- Ring Synthesis 524
- 1,2,3,4-Tetrahydro-1,3,5-triazines
- Ring Synthesis 760
- Hexahydro-1,3,5-triazines
- Ring Synthesis 524
● 1,2,3-Triazole



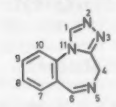
2*H*-

- 1,2,3-Triazoles
- from Like Ring Skeletons 694
- Ring Synthesis 262
- 2,5-Dihydro-1,2,3-triazoles
- Reactions with Retention of the Ring Skeleton 694
- 4,5-Dihydro-1,2,3-triazoles
- from Like Ring Skeletons 743
- Reactions with Retention of the Ring Skeleton 743
● 1,2,4-Triazole

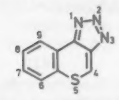


2*H*- 4*H*-

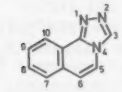
- 1,2,4-Triazoles
- Ring Synthesis 813
- Anellation Reactions 273, 289
- Tetrahydro-1,2,4-triazoles
- Ring Synthesis 811
● [1,2,4]Triazolo[4,3-*a*][1,4]benzodiazepine



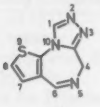
- Ring Synthesis 813
● 1,2,3-Triazolo[4,5-*c*][1]benzothiapyran



- 1,3a,4,9b-Tetrahydro-1,2,3-triazolo[4,5-*b*][1]benzothiapyrans
- Ring Synthesis 465
● 1,2,4-Triazolo[3,4-*a*]isoquinoline

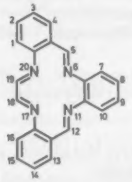


- 2,3-Dihydro- 1,2,4-triazolo-[3,4-*a*]isoquinolines
- Ring Synthesis 813
● [1,2,4]Triazolo[3,4-*c*]thieno-[2,3-*e*][1,4]diazepine



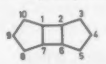
4*H*-

- 1,2-Dihydro-4*H*-[1,2,4]triazolo-[3,4-*c*]thieno[2,3-*e*][1,4]diazepines
- Ring Synthesis 813
● Tribenzo[*b*,*f*,*l*][1,4,8,11]tetraazacyclotetradecine



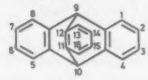
- 17,18,19,20-Tetrahydro Derivatives
- Ring Synthesis 680
● Tricarboxylic Acid Esters
- 3-Alkene-1,1,6-tricarboxylic Esters
- Synthesis 481 (5209)
● Tricyclo[4.2.2.0^{2,5}]decane

- Tricyclo[4.2.2.0^{2,5}]deca-3,7-dienes
- Anellation Reactions 384
● Tricyclo[5.3.0.0^{2,6}]decane



- Tricyclo[5.3.0.0^{2,6}]decadienes
- Ring Synthesis 943
● Tricyclo[4.3.0.0^{1,3}]nonane

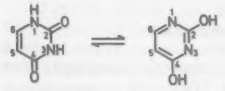
- Tricyclo[4.3.0.0^{1,3}]-4,7-nonadienes
- Ring Synthesis 247
● Tryptycene



- Ring Synthesis 437
- Anellation Reactions 438
● Triketones
- 2-Acyl-1,3-diketones
- Cyclization Reactions 184
- Cyclic 1,2,3-Triketones
- Reactions 192
● Trimethaphosphoric Acid, Cyclic
- Synthesis 602
● Trisulfides
- Synthesis 719
● Trithioboric Acid Esters
- Reactions 411 (5203)
● Trithiocarbonic Acid Esters
- Synthesis 286, 812, 816
● Trithiones

- Ring Synthesis 260
● Tropylium Salts
- Reactions 247

● Uracils



- Reactions 464, 748
● Urea Acetals
- Reactions 275
● Ureas
- Synthesis 378, 379, 395
- Cyclization Reactions 378, 379, 637
- Reactions without Cyclization 274
- *N*-Aminocarbonyl-heterocyclic Compounds
- Synthesis 374
- *C*-Ureido-*N*-heterocyclic Compounds
- Synthesis 380

● Verdazyls
- Reactions 276
● Vitamin A and Relatives
- Synthesis 733
● Vitamin D Relatives
- Reactions 741
● Vitamin E and Relatives
- Synthesis 888

● Xanthic Acid Esters
see: Dithiocarbonic Acid Esters
● Xanthotoxin and Relatives
- Reactions 274

● Ylides
- *N*-Methylene-*N*-heteroarenium Ylides (*N*-Heteroarenium Methylides)
- Reactions 301, 653
- *N*–*C* Ylides
- Reactions 207
- *N*–*N* Ylides
see: *N*-Imino Ylides
- *P*–*C* Ylides
see: Phosphoranes
- *S*–*C* Ylides
see: Sulfuranes
- *S*–*N* Ylides
see: Sulfilimines
● Ynamines
- Cyclization Reactions 45
- Reactions without Cyclization 621

REACTION INDEX

- **Acetal Cleavage**
- ***O,O*-Acetals**
- Hydrolytic or Solvolytic Cleavage 63
- Reductive Cleavage 825
- with Iodotrimethylsilane 865 (5341)
- ***S,S*-Acetals**
- with Sulfuryl Chloride/Water 555 (5248)
- **Acetalization**
- **Aldehydes and Ketones**
- with Alcohols 63
- with Alkylthiotrimethylsilanes 239 (5149), 325 (5170), 719
- with Arylthiotrimethylsilanes 325 (5170)
- with Dimercaptoalkanes 364
- with Diols 63, 295
- with Thiols 164 (5120)
- **Lactones**
- with Alkylthiodimethylaluminum 719
- **Acylation**
- ***C*-Acylation**
- Reductive Acylation of C=C Groups 792 (5317), 942 (5370)
- Replacement of Halogen via Metallation 29
- Replacement of Hydrogen 672, 675, 710 (5289), 735, 787 (5305), 789 (5310)
- Replacement of Hydrogen via Metallation 37, 324 (5169), 478, 682
- Replacement of Hydrogen via Metallation, Carbonylation, and Alkylation 555 (5249)
- Replacement of Hydrogen via Rearrangement 925
- Replacement of Si-Functions 629 (5269)
- ***N*-Acylation**
- Replacement of Hydrogen 313, 490, 915, 941 (5366)
- ***O*-Acylation**
- Cyclobutenediones 661
- Replacement of *O*-Alkyl Groups 161 (5110)
- Replacement of Hydrogen 587, 925
- **Acylation-Bromination**
- C=O-Groups + Acyl Bromides 593
- **Acylation-Chlorination**
- C=O-Groups + Acyl Chlorides 593
- **Acyloxychlorination of Alkenes**
- with Chromyl Chloride/Acyl Chlorides 553 (5243)
- **Acyloxyiodination of Alkenes**
- with Carboxylic Acids/Iodine 402
- ***C*-Acyloxylation**
- Cleavage of Epoxides 862 (5330)
- Replacement of Hydrogen using Lead(IV) Carboxylates 292, 629 (5267)
- **Acyloxy 1,3-Transposition** 791 (5314)
- **Acylthiolation**
- Alkenes + Thioacetic Acid 228
- ***C*-(1-Alkenylation)**
- 1-Alkenylation of Vinyloxiranes 528
- Reductive 1-Alkenylation of Aldehydic and Ketonic Carbonyl Groups 162 (5114), 458, 612, 941 (5367)
- Reductive 1-Alkenylation of C=C Groups 411 (5200), 626 (5258), 860 (5325)
- Reductive 1-Alkenylation of C≡C Groups 454
- Replacement of Halogen 652
- Replacement of Hydrogen 937 (5354)
- Replacement of Hydrogen via Metallation 74 (5095)
- Replacement of Metals 867 (5348)
- ***C*-(2-Alkenylation)**
- Replacement of Hydrogen 229
- ***N*-(2-Alkenylation)**
- Replacement of Hydrogen 787 (5303)
- ***C*-Alkoxycarbonylamination**
- Replacement of Halogen 632 (5277)
- ***C*-Alkoxycarbonylmethylation**
- Indirect Replacement of Hydrogen 486 (5221)
- Replacement of Halogen 143
- Replacement of Hydrogen via Metallation 225
- ***C*-Alkoxycarbonylation**
- Replacement of Halogen via Metallation 31
- **Alkoxyiodination of Alkenes**
- using Alcohols/Iodine 402
- **Alkoxylation**
- ***C*-Alkoxylation**
- Alkoxylation of C=C Groups 788 (5306)
- Alkoxylation of C≡C Groups 161 (5111)
- Cleavage of Epoxides 862 (5330)
- Replacement of Halogen 53, 379, 380
- Replacement of Hydrogen 283
- ***N*-Alkoxylation**
- Replacement of Hydrogen via Metallation 679
- ***P*-Alkoxylation**
- Replacement of Halogen 667
- **Alkylation**

see also: Benzylation

- ***C*-Alkylation**
- Additive Alkylation of Cationic Carbon Compounds 410 (5197)
- Allylic Replacement of Halogen 708 (5282)
- Alkylation with Elimination of HCN 406 (5186)
- Alkylative Ring Cleavage of Epoxides 709 (5284)
- Indirect Replacement of Hydrogen 729
- Reductive Alkylation of Aldehydic and Ketonic Carbonyl Groups 72 (5091), 149, 162 (5114), 861 (5328)
- Reductive Alkylation of Carboxamide Groups 857
- Reductive Alkylation of Carboxy Groups 429
- Reductive Alkylation of C=C Groups 408 (5191), 411 (5200), 628 (5265), 707 (5279), 714, 789 (5308)
- Reductive Alkylation of C≡C Groups 454
- Reductive Alkylation of C=N Groups 522, 712 (5295)
- Reductive Alkylation of Cyano Groups 149
- Reductive Alkylation of Cyclobutenediones 661
- Reductive Alkylation of Ester Groups 149
- Reductive Alkylation of Nitroarenes 436
- Replacement of Halogen 9, 407 (5187), 483 (5214), 485 (5220), 714, 760, 785 (5297), 860 (5324)
- Replacement of Halogen via Metallation 27, 862 (5331)
- Replacement of Hydrogen 315, 709 (5286), 787 (5303), 823, 882, 883, 937 (5354), 941 (5365)
- Replacement of Hydrogen via Metallation 35, 327 (5142), 319 (5154), 321 (5158), 323 (5165), 335, 372, 412 (5206), 828, 840
- Replacement of Metals 867 (5348)
- Replacement of O-Functions 21, 72 (5091), 74 (5097), 231 (5123), 388, 757
- ***N*-Alkylation**
- indirect Alkylation 74 (5097)
- Reductive Alkylation of *N*-Heteroarenes 447
- Replacement of Hydrogen 47, 71 (5088), 643, 766, 921, 944 (5377)
- ***O*-Alkylation**

see also: Etherification

- Replacement of Cations 135
- Replacement of Hydrogen 145
- ***P*-Alkylation**
- Additive Alkylation 315
- Replacement of Hydrogen 133
- ***S*-Alkylation**
- Additive Alkylation 46
- Replacement of Metals 366
- **Alkylation-Sulfenylation** 360
- **Alkylidenation**
- ***C*-Alkylidenation**

see also: Carbonyl Olefination

- Carbonyl-Methylene Condensation 56, 58, 178, 386, 931
- Indirect Carbonyl-Methylene Condensation 747
- Replacement of H and SH 711 (5291)
- ***O,O*-Alkylidenation**
- Replacement of Hydrogen 48
- ***C*-Alkylsulfenylation**
- Additive Alkylsulfenylation of C=C Groups 368
- Cleavage of Epoxides 862 (5330)
- Replacement of Halogen 53, 306, 359
- Replacement of Hydrogen 360
- Replacement of Hydrogen via Metallation 577
- Replacement of N-Functions 56, 59
- Replacement of O-Functions 240 (5150), 944 (5375)
- Replacement of Other S-Functions 53
- ***C*-Alkylthiolation**

see: C-Alkylsulfenylation

- ***C*-(1-Alkynylation)**
- Cleavage of Epoxides 26
- Reductive 1-Alkynylation of C=C Groups 163 (5116)
- Reductive 1-Alkynylation of Ester Groups 307
- Replacement of Halogen 626 (5259), 860 (5324)
- Replacement of Hydrogen 937 (5354)
- Replacement of O-Functions 231 (5123), 554 (5247)
- ***C*-(2-Alkynylation)**
- Reductive 2-Alkynylation of C=C Groups 150
- **Amidation**
- **Carboxylic Acid Esters**
- with Aminoaluminum Compounds 863 (5334)
- with Ammonia or Amines 752
- **Carboxylic Acids**
- with Ammonia or Amines 915
- **Carboxylic Acids via Reactive Acid Derivatives**
- with Ammonia or Amines 622, 915
- **Thiocarboxylic Acid Esters**
- with Ammonia or Amines 865 (5430)
- ***C*-Amination**
- Additive Diamination of C=C Groups 859 (5321)

- Cleavage of Epoxides 862 (5330)
- Reductive Amination of Aldehydes and Ketones 766
- Reductive Amination of Carbonyl Groups (indirect) 553 (5242)
- Replacement of Cyano Groups 199
- Replacement of Halogen 379, 380, 539, 650, 721
- Replacement of O-Functions 21, 368, 465, 650, 844, 875

● 1-Aminoalkylation
- **C-(1-Aminoalkylation)**
- 1-Aminoalkylation of C=C Groups 487 (5226)
- **C-Aminomethylation**
- Replacement of Halogen 72 (5090), 409 (5194)
- Replacement of Hydrogen via Metallation 236 (5140)

● Aminocarbonylation
- **C-Aminocarbonylation**
- Replacement of Hydrogen 374
- **N-Aminocarbonylation**
- Replacement of Hydrogen 374

● C-Aminomethylenation
- Replacement of Hydrogen 185

● C-Aminothiocarbonylation
- Replacement of Hydrogen 716

● Aromatization of Cyclic Systems
- Oxidative Aromatization 712 (5296)

● C-Arylation
- Additive Arylation of Cationic Carbon Compounds 410 (5197)
- Reductive Arylation of Carboxamide Groups 857
- Reductive Arylation of C=C Groups 187, 411 (5200)
- Reductive Arylation of C≡C Groups 454
- Reductive Arylation of Cyclobutenediones 659
- Reductive Arylation of Ester Groups 468
- Replacement of Halogen 9, 20, 74 (5096), 652, 860 (5324)
- Replacement of Hydrogen 922
- Replacement of O-Functions 21, 231 (5123), 757

● C-Aryloxylation
- Cleavage of Epoxides 862 (5330)
- Replacement of Halogen 380

● C-Arylselenylation
- Cleavage of Epoxides 862 (5330)
- Complex Reaction 792 (5319)
- Reductive Arylselenolation of C=C Groups 418
- Replacement of O-Functions 942 (5369)

● C-Arylsulfenylation
- Cleavage of Epoxides 862 (5330)
- Replacement of Halogen 53, 316, 379, 380, 785 (5299)
- Replacement of Hydrogen 360, 629 (5267), 720
- Replacement of O-Functions 944 (5375)
- Replacement of Other S-Functions 53

● Asymmetric Synthesis
- Intramolecular Transfer of Asymmetry 353
- Review 329, 413
- **Alcohols**
- Using Chiral Reaction Components 163 (5117)
- using Chiral Reagents 938 (5356)
- **α-Aminonitriles**
- using Chiral Reaction Components 552 (5239)
- **Chloroalkanes**
- using Chiral Reaction Components 407 (5188)
- **Crown Ethers**
- using Chiral Reaction Components 688
- **α-Hydroxycarboxylic Acids**
- in the Presence of Chiral Catalysts 343
- using Chiral Reaction Components 325 (5172)
- **α-Hydroxycarboxylic Esters**
- in the Presence of Chiral Catalysts 233 (5131)
- using Chiral Reaction Components 237 (5141)
- **Lactams**
- using Chiral Reaction Components 685
- **Oxiranes**
- in the Presence of Chiral Catalysts 76 (5101)
- **Pyrrolidines**
- using Chiral Reaction Components 752
- **Sulfoxides**
- using Chiral Reaction Components 724
- **Thiols**
- using Chiral Reaction Components 714

● Azo Coupling
- with *P*-Heterocyclic Compounds 846

● Baeyer-Villiger Reaction 239 (5147), 944 (5378)

● Bamford-Stevens Reaction 234 (5134), 306, 481 (5207), 535

● Barbier-Wieland Degradation 468

● Beckmann Fragmentation 932

● Benzylation and Analogous Reactions
- **C-Benzylation**
- Replacement of Halogen via Metallation 149
- **O-Benzylation**
- Replacement of Metals 619

● Bond Isomerization
see: Double-Bond Shifts etc.

● C-Borylation
see also: Hydroboration
- Replacement of Hydrogen via Metallation 407 (5189), 408 (5192) (5193)

● C-Bromination
- by Cleavage of Epoxides 139, 232 (5126)
- Replacement of As-Functions 707 (5279), 785 (5299)
- Replacement of Hydrogen 18, 141, 231, 290, 383, 550 (5235), 551 (5238), 693
- Replacement of Hydrogen (indirect) 626 (5260)
- Replacement of Hydrogen via Metallation 159 (5104)
- Replacement of Metals 625 (5256)
- Replacement of N-Functions 406 (5185), 551 (5237)
- Replacement of O-Functions 620
- Replacement of Se-Functions 707 (5279)
- Replacement of Si-Functions 551 (5236)

● Bromofluorination of Alkenes
- with *N*-Bromoacetamide + HF 217

● Bromohydroxylation of Alkenes
- with 2,4,4,6-Tetrabromocyclohexadienone 605

● Carbonyl Olefination
- **Olefination of Aldehydes and Ketones**
- Non-enolizable Ketones + Dimsylsodium + 2-Chloro-1,3,2-benzodioxaphosphole 723
- with Alkyldiarylphosphine Oxides 940 (5362) (5363) (5364)
- with Arsoranes or Arsonium Salts 616
- with *O,S*-Dialkyl Dithiocarbonates 717
- with 1-Lithioalkylsilanes 938 (5357)
- with Lithiomethylstannanes 859 (5322)
- with Lithio-2-silyl-1,3-dithianes 364
- with Lithium 1-Lithiothiolates 711 (5291)
- with Phosphine Oxides (indirect) 236 (5139)
- with Phosphonic Esters 28, 31, 131, 133, 161 (5110), 310, 327 (5176), 608
- with Phosphoranes or Phosphonium Salts 52, 67, 240 (5151), 327 (5176), 616, 657, 826
- **Olefination of Cyclic Semiacetals**
- with Phosphoranes or Phosphonium Salts 418

● Cascade Syntheses 155

● Chlorination
- **C-Chlorination**
- Chlorinative Ring Cleavage of Epoxides 707 (5278)
- Cleavage of C–C Bonds 227
- Replacement of As-Functions 707 (5279), 785 (5299)
- Replacement of Hydrogen 18, 327 (5176), 376, 550 (5235)
- Replacement of Hydrogen via Metallation 159 (5104)
- Replacement of Metals 625 (5256)
- Replacement of N-Functions 406 (5185)
- Replacement of O-Functions 53, 380, 407 (5188), 481 (5208), 597, 855, 889
- Replacement of Other Halogens 371
- Replacement of Se-Functions 707 (5279)
- **N-Chlorination**
- Replacement of Hydrogen 76 (5102), 240 (5152)

● Claisen Condensation (Ester Condensation) 162 (5113)

● Claisen Rearrangement 235 (5137)

● Cope-Mamlock Reaction 72 (5090)

● Cope Rearrangement 532, 612, 934

● Cyanation
- **C-Cyanation**
- Reductive Cyanation of Aldehydic and Ketonic Carbonyl Groups 238 (5146), 411 (5202)
- Reductive Cyanation of Amide Carbonyl Groups 274
- Reductive Cyanation of C=N Groups 522
- Replacement of Halogen 316, 326 (5175), 868 (5349), 894
- Replacement of Hydrogen 166
- Replacement of O-Functions 364
- Replacement of S-Functions 556 (5252)
- **Si-Cyanation**
- Replacement of Halogen 154

● N-(2-Cyanoalkylation)
- Replacement of Hydrogen 155

● Cyanohydrin Synthesis
- using Cyanotrimethylsilane 219
- using Inorganic Cyanides + Alkyl Halides 863 (5333)
- using Inorganic Cyanides + Carboxylic Anhydrides 863 (5333)

● Cycloaddition (intermolecular)
- **[2+1]Cycloaddition**
see also: Cyclopropanation
- C–C + C 16, 79, 345
- **[1+1+1+1]Cycloaddition**
- C+C+C+C 873
- **[2+2]Cycloaddition**
- S–C + C–C 818
- C–C + C–C 3–18, 110, 187, 250, 486 (5221), 543, 589, 870
- **[3+2]Cycloaddition**
- N–N–N + C–C 313, 465
- N–N–C + C–C 384, 595
- C–N–C + C–C 461, 486 (5223)
- O–N–C + C–C 43
- O–C–C + C–C 201, 245
- C–C–C + C–C 126
- **[4+1]Cycloaddition**
- N–C–N–C + P 527
- **[2+2+2]Cycloaddition**
- N–C + C–C + C–C 177
- S–C + C–C + C–C 260
- **[3+2+1]Cycloaddition**
- O–C–C + C–C + C 210
- **[4+2]Cycloaddition**
- N–C–N–C + N–C 760
- N–C–C–C + C–C 171
- O–C–C–C + C–C 190, 273
- C–C–C–C + S–C 173, 817
- C–C–C–C + C–C 52, 120, 159 (5105), 189, 482 (5212), 938 (5355)

- [5+1]Cycloaddition
- N–C–C–C–N + S 262
- N–C–C–C–N + C 40
- C–C–N–C–C + N 911
- C–C–O–C–C + N 911
- C–C–S–C–C + N 911
- C–C–C–C–C + N 176
- C–C–C–C–C + C 272
- **Cycloaddition (intramolecular)**
- General, C → C
- Alkenoic Acids + Phosphoric Acid 476
- C_4 Ring
- Thermal Cyclization of Diallenes 13
- S–C–N–C–C
- N–C Ring Closure 289
- N–C–C–C–C
- N–C Ring Closure 687
- O–C–C–C–C
- O–C Ring Closure 476
- C_5 Ring
- Intramolecular Friedel-Crafts Alkylation 889
- N–N–C–C–C–C
- N–C Ring Closure 199
- N–C–N–C–C–C
- C–C Ring Closure 760
- N–C Ring Closure 673
- N–C–C–C–C–C
- C–C Ring Closure 62, 181, 506
- C_6 Ring
- Catalyzed Cyclization of 6-Alkenals 147
- Photochemical Cycloaddition 500, 855
- **Cyclocondensation (intermolecular)**
- General, Bifunctional Compounds + Thiophosgene
- Review 807
- General, C_n + C
- Bis[bromomethyl] Compounds + Sodiomalodinitrile 274, 275
- General, C_n + O–O
- 1,n-Bis[trifluoxy]-alkanes + Bis[tributylstannyl] Peroxides 75 (5098)
- General, C_n + S
- Bis[chloromethyl]Compounds + Sodium Sulfide 214
- General, N–C_m–N + C_n
- Diamines + Dicarboxylic Dichlorides 156, 223
- General, to give Heterocyclic Compounds containing a P–N–N Linkage
- Review 557
- N–C–C
- N–C + C 556 (5253)
- O–C–C
- O–C + C 33, 35, 409 (5196), 552 (5241), 823
- C_3 Ring

see also: Cyclopropanation

- C–C + C 86, 90, 275, 304, 320 (5155), 481 (5207) (5209), 885, 939 (5359)
- N–C–C–C
- N–C + C–C 487 (5226)
- N–C–C + C 328 (5178)
- N–N–P–N–C
- N–N + N–C + P 559
- N–N–C–N + P 559
- O–P–N–N–C
- O–C–N–N + P 562
- N–N–P–C–C
- N–N–C–C + P 557
- S–P–S–C–C
- S–C–C–S + P 667
- S–S–C–N–C
- S–C–N + S–C 625 (5257)
- Se–N–N–C–C
- N–N–C–C + Se 597
- Se–N–C–N–C
- Se–C–N + N–C 769
- N–N–C–C–C
- C–C–C + N–N 698, 779
- N–N–C–C + C 637
- N–C–N–C–C
- C–N–C + N–C 741
- O–N–C–C–C
- O–N–C + C + C 55
- O–C–O–C–C
- O–C–C–O + C 826
- S–C–N–C–C
- C–N–C–C + S 363
- S–C–S–C–C
- S–C–C–S + C 737, 826
- N–C–C–C–C
- N–C–C + C–C 487 (5225), 591
- C–N–C + C–C 206, 207
- C–C–C + N–C 412 (5204)
- C–C–C–C + N 464
- O–C–C–C–C
- O–C–C + C–C 66, 182, 292, 476
- C–C–C + O–C 319 (5154), 791 (5315)
- C_5 Ring
- C–C + C–C + C 246
- C–C–C + C–C 150, 468
- C–C–C–C + C 885
- N–C–N–C–N–C
- N–C + N–C + N–C 40
- N–C–N–C + N–C 40
- O–C–N–C–N–C
- N–C–N + O–C + C 524
- S–C–S–C–N–C
- S–C–N–C + S + C 443
- N–N–C–C–C–C
- N–N–C–C + C–C 185
- C–C–C–C + N–N 464
- N–C–N–C–C–C
- N–C–N + C–C + C 272
- N–C–N + C–C–C 780
- N–C–C–C + N–C 249
- N–C–C–N–C–C
- N–C–C + N–C–C 249
- N–C–C–N + C–C 373, 438
- O–C–N–C–C–C
- C–O–C–C + N–C 38
- O–C–C–C–N + C 41
- O–C–O–C–C–C
- O–C–C–C–O + C 295
- S–C–N–C–C–C
- S–C–N–C + C–C 45
- S–C–C–N–C–C
- S–C–C–N + C–C 438
- S–C–S–C–C–C
- S–C–C–C–S + C 239 (5149), 826
- N–C–C–C–C–C
- C–C + C–C + N + C 191
- N–C–C + C–C–C 182, 183, 184, 681, 691
- C–N–C + C–C–C 207
- C–C–C + C–C + N 192
- O–C–C–C–C–C
- O–C–C–C–C + C 843, 886, 888
- C_6 Ring
- C–C + C–C + C–C 201
- C–C–C–C + C–C 712 (5296)
- O–C–C–N–N–C–C
- O–C–C–N–N + C–C 332
- N–N–C–C–C–C–C
- N–N–C–C + C–C–C 748
- C_7 Ring
- C–C–C–C–C + C–C 592
- S–C–C–C–C–C–C–C
- C–C–C–C–C–C–C + S 214
- C_8 Ring
- C–C–C–C–C–C–C + C 274
- **Cyclocondensation (intramolecular)**
- General, N → C
- H_2N–.....–COOH + Acid 635
- Lactam Formation 291, 614, 685
- R–NH–.....–COOH + Hexamethyldisilazane 614
- General, C → C
- Alkanedioic Acids, Acidic Decarboxylation + Cyclization 368
- 1,n-Alkanediones + Base 221
- CH≡C.....C–Cl + Base 604
- 4- or 5-Oxoalkanals + Acid or Base (5300) (5301) 786
- C_3 Ring 46, 728, 733, 943 (5373)
- C_4 Ring 871
- N–N–C–C–C
- N–C Ring Closure 60, 481 (5207)
- O–N–C–C–C
- N–O Ring Closure 830
- O–C–N–C–C
- O–C Ring Closure 317, 832
- O–C–S–C–C
- S–C Ring Closure 286
- S–N–C–C–C
- N–S Ring Closure 59
- N–C–C–C–C

see also: Fischer Indole Synthesis

- N–C Ring Closure 250, 687, 931
- S–C–C–C–C
- S–C Ring Closure 59
- C–C Ring Closure 368
- C_5 Ring 160 (5107), 221, 264, 322 (5163), 786 (5300) (5301), 939 (5360)
- N–C–N–C–C–C
- N–C Ring Closure 379
- N–C–C–N–C–C
- N–C Ring Closure 317
- O–C–N–C–C–C
- O–C Ring Closure 378
- O–C–S–C–C–C
- S–C Ring Closure 286
- N–C–C–C–C–C
- C–C Ring Closure 205, 504, 698
- S–C–C–C–C–C
- S–C Ring Closure 56, 58, 228
- C_6 Ring 342, 502, 786 (5300)
- **Cyclodehydrogenation (intramolecular)**
- C_5 Ring
- 3-Benzoylindoles + Palladium(II) Salts 607
- C_6 Ring
- 3-Benzoylindoles + Palladium(II) Salts 607
- Photochemical Cyclodehydrogenation of 1-Styrylnaphthalenes 774
- C_7 Ring
- 1,3-Diphenylpropanes + Thallium(III) Salts 323 (5164)
- **Cyclopropanation**
- 2-Alkenenitriles 481 (5207)
- Alkenes 79–120, 344, 735, 939 (5359)
- 1-Alkenyl Ketones 481 (5209)
- Arenes 255
- Cyclic Ketones 90
- Enol Ethers 320 (5155)
- Tetracyanoethylene 255, 256
- **Cyclopropenation of Alkynes** 99
- ***C*-Cyclopropylation** 71 (5087)
- **Darzens Reaction** 823
- **Dealkylation**
- Alkylarenes
- by Transalkylation 214, 435
- ***N*-Alkyl Compounds**
- by Catalytic Hydrogenation 712 (5295)
- Alkylquinol Ethers
- by Transalkylation with Toluene 399
- **Deamination**

see: Hydrodeamination

- **Dearylselenylation** 476, 860 (5323)
- **Debromination**
- *vic*-Dibromoalkanes
- with Sodium Hydrogen Telluride 311
- with Sodium Thiosulfate 234 (5133)
- **Dechlorination**
- *vic*-Dichloroalkanes
- with Zinc 8
- **Dehydration**
- Alcohols
- with Phosphorus Pentoxide 604, 939 (5358)

- with Thionyl Chloride/Amines 409 (5195)
- **Aldoximes**
- with Diphosphorus Tetraiodide 905
- with Selenium Dioxide 703
- with Trimethylamine/Sulfur Dioxide 702
- **1-Alkoxyalkyl Hydroperoxides**
- with Acyl Halides/Base 67
- **Carboxamides**
- with Carboxylic Anhydrides 238 (5145)
- **Formamides**
- with 2-Halo-1,3-benzoxazolium Salts 411 (5201)
- with Phosphoryl Chloride/Amines 840

● **Dehydrobromination**
- **Alkylsulfonium Bromides**
- with Base 710 (5289)
- **Bromoalkenes Type −CH=CBr−**
- with Base 290
- ***vic*-Bromofluoroalkanes**
- with Base 217
- **3,4-Dibromoalkenoic Esters**
- with Base 410 (5198)
- **Dibromocyclohexenes**
- with Base 879

● **Dehydrochlorination**
- ***N*-Chloro Compounds**
- with Base 240 (5152)
- **3-Chloro-4-iodo-3-alkenoic Esters**
- with Base 410 (5198)
- **3,4-Dichloro-2-alkenoic Esters**
- with Base 410 (5198)

● **Dehydrosulfenylation**
- Oxidative Dehydrosulfenylation 328 (5179)

● **Dehydrosulfonylation**
- by Base 323 (5166)

● **Dehydrosulfurization**
- **Dithiocarbamic Acids**
- with 2-Chloro-1-methylpyridinium Iodide/Base 239 (5148)
- **Thioureas**
- with 2-Chloropyridinium Salts 164 (5119)

● **Dehydroxysilylation**
- **2-Silylalkanols**
- with Lewis Acids 232 (5126)

● **Demercuration**
- Reductive Demercuration 914

● **Denitration**
- ***vic*-Dinitroalkanes**
- Reductive Denitration 482 (5210)
- ***N*-Nitro Compounds**
- Reductive Denitration 76 (5103)

● **Deoxygenation of Epoxides**
- with Diphosphorus Tetraiodide 905

● **Desilylation of *C*-Silyl Compounds**
- with Acid 755, 861 (5329)

● **Desulfenylation**
- ***C*-Alkylthio Compounds**
- by Catalytic Hydrogenation 289
- ***C*-Arylthio Compounds**
- by Catalytic Hydrogenation 328 (5179)
- **Heterocyclic *C*-Sulfenyl Compounds**
- with Zinc/Protic Systems 407 (5187)

● **Desulfinylation of *C*-Sulfinyl Compounds**
- Reductive Desulfinylation 163 (5117)
- Thermal or Catalytic Desulfinylation 720

● **Desulfonylation**
- **Cyclic Sulfones (Sulfone Contraction)**
- with Base 733
- Photochemical Desulfonylation 579
- Thermal or Catalytic Desulfonylation 214
- ***C*-Sulfonyl Compounds**
- with Sodium Amalgam/Alcohols 74 (5095)
- ***N*-Sulfonyl Compounds**
- Hydrolytic Desulfonylation 727

● **Desulfonyloxylation of *C*-Sulfonyloxy Compounds**
- Reductive Cleavage 71 (5086)

● **Desulfurization**
- **Episulfides (Thiiranes)**
- Thermal or Catalytic Desulfurization 738
- with Phosphorus(III) Compounds 738
- **Thiophosphoric Acid Triamides**
- with Phosphorus(III) Compounds 564

● ***C*-Deuteration**
- by Reduction with Complex Aluminum Deuterides 285
- M/D Exchange with D_2O 319 (5154)

● **Diazotization** 234 (5132)

● ***C*-Dicyanomethylation**
- Replacement of O-Functions 250

● **Dicyanomethylenation**
- ***C*-Dicyanomethylenation**
- by Carbonyl-Methylene Condensation 178, 241
- ***N*-Dicyanomethylenation**
- Additive Dicyanomethylenation 384

● **Diels-Alder Reaction**
see also: [4+2]Cycloaddition
- Intramolecular Diels-Alder Reactions of 1,2-Dihydrocyclobutabenzene Derivatives 795
- with Alkynes 52
- with Methylthiomaleic Anhydride 482 (5212)
- with Thiocarbonic Dichloride 817
- with 2-Thioxo-1,3-dioxole 716

● **Dimerization**
- Dienes 345
- Malodinitrile 170

● **Double-Bond Shifts etc.**
- **Alkenes**
- by Base 235 (5137), 321 (5158)
- by Liquid Sulfur Dioxide 321 (5160)
- **Alkenoic Esters**
- by Base 328 (5180)
- **Alkenyl Esters**
- by Base 439
- **Alkynes**
- by Base 231 (5124)

● **Epoxidation**
- **Alkenes**
- with Alkyl Hydroperoxides 346
- with Hydrogen Peroxide 300, 347
- with Hydroperoxy Compounds 76 (5101)
- with 2,4,4,6-Tetrabromocyclohexadienone 605
- **Alkenols**
- with Organic Peroxoic Acids 484 (5217)
- **Tertiary Allylic Alcohols**
- with Chromium(VI) Compounds 236 (5138)

● **Ester Cleavage**
- **Carboxylic Esters**
- Hydrolytic Cleavage 76 (5102)
- with Complex Aluminum Hydrides 419
- with Organometallic Reagents 942 (5371)
- **Lactones**
- Hydrolytic Cleavage 66, 304
- **Phosphonic Esters**
- Hydrolytic Cleavage 470, 612
- **Phosphoric Esters**
- with Hydrogen Bromide 602
- **Phosphorous Esters**
- Hydrolytic Cleavage 135
- **Silyl Phosphonates**
- Hydrolytic Cleavage 611
- **Thiocarboxylic *S*-Esters**
- Reductive Cleavage 75 (5100)

● **Esterification**
- **Carboxylic Acids**
- with Alcohols or Phenols 33, 929
- with Alkyl 2-Halo-3-oxoalkanoates 711 (5290)
- with Trialkyl Trithioborates 411 (5203)
- **Carboxylic Acids as Reactive Acid Derivatives**
- with Alcohols or Phenols 867 (5347)
- with Mercaptans 715
- **Dithiocarbonic Acid Salts**
- with Alkyl Halides or Sulfonates 366
- **Dithiooxalic Acid**
- with Alkyl Halides 849
- ***N*-Heterocyclic Carboxylic Acids**
- with Alcohols or Phenols 752
- **Sulfinic Acids**
- with Alcohols via Reactive Acid Derivatives 441

● **Ether Cleavage**
- 1-Alkenyl Alkyl Ethers 709 (5286)
- Alkyl Aryl Ethers 627 (5263), 771
- Dialkyl Ethers 549 (5232), 550 (5233), 771, 825
- Enol Ethers 866 (5344)

● **Etherification**
see also: O-Alkylation
- *o*-Diphenols + Haloalkanols + Base 223

● **Exchange of Hetero Atoms**
- **O/N Exchange**
- in Heterocyclic Rings 244, 292
- **O/S Exchange**
- in Carbonyl Compounds 554 (5246), 685, 831
- **Se/P Exchange**
- in Heterocyclic Rings 45

● **Finkelstein Reaction** 316, 371, 435

● **Fischer Indole Synthesis** 445

● ***C*-Fluorination**
- Replacement of Other Halogens 127, 700

● ***C*-Formylation**
- Replacement of Hydrogen 161 (5112)
- Replacement of Metals 403
- Replacement of Si-Functions 629 (5269)

● **Fragmentation Reactions (C−C Cleavage)**
- Acetals of Cyclic Ketones 326 (5173)
- 1-Alkynes 462
- Amine Oxides 72 (5090)
- Bicyclic Enethiol Ethers 228
- ***gem*-Bis[4-hydroxyphenyl]-alkanes 396
- Cyclic 1,3-Diketones 75 (5099)
- Cycloalkanones 326 (5174)
- Cycloalkyl Ethers 410 (5199)
- ***gem*-Dihalocyclopropanes 320 (5155)
- α-Oxolactones 162 (5113)

● **Friedel-Crafts Reactions**
- 1-Alkenylation with Vinylogous Acyl Halides 21
- Aminothiocarbonylation with Alkoxycarbonyl Isothiocyanates 716
- Cyclization 62
- with Acyl Halides 672
- with Halocyclobutenediones 652

● **Gabriel Synthesis** 223

● ***C*-(1-Haloalkylation)**
- Replacement of Hydrogen 214, 233 (5129), 435

● ***S*-Halomethylation**
- Replacement of Hydrogen 868 (5351)

● ***C*-Heteroarylation**
- Reductive Heteroarylation of Aldehydic and Ketonic Carbonyl Groups 939 (5358)
- Reductive Heteroarylation of C=C Groups 160 (5109)

● **Hofmann Elimination of Quaternary Aminium Salts** 236 (5140)

● **Homologation of the C-Chain**
- **+ C**
- Aldehydes or Ketones + Chlorotrimethylsilylmethyllithium 625 (5255)
- **+ C_2**
- Alkyllithium + Vinyl Compounds 707 (5279)

● **Hydration**
- **Alkenes**
- Indirect Hydration 709 (5285)
- with Mercury(II) Salts/Water 468
- **Alkynes**
- with Mercury-impregnated Resins/Water 671

- **Nitriles**
- Indirect Hydration 264
- **● Hydroalumination**
- **Alkenes**
- with Complex Aluminum Hydrides 709 (5285)
- **● Hydroboration**
- **Alkenes**
- with 9-BBN-9-*d* 846
- with Borane-Amines 146
- with Borane (Diborane) 677
- with Dibromoborane:Dimethyl Sulfide 482 (5211)
- **Non-Conjugated Dienes**
- with Secondary Boranes 712 (5294)
- **Alkynes**
- with Chloroborane 549 (5231)
- with Secondary Boranes 322 (5162), 325 (5171)
- **● Hydrobromination**
- C=C Double Bonds 708 (5281)
- **● Hydrochlorination**
- C=C Double Bonds 708 (5281)
- **● Hydrodeamination**
- via Diazotization 937 (5353)
- **● Hydrodebromination**
- **3-Bromo-2-alkenals**
- by Catalytic Hydrogenation 235 (5135)
- **α-Bromocarbonyl Compounds**
- with Metal Carbonyls 406 (5184)
- ***vic*-Dibromoalkanes**
- with Sodium Hydrogen Telluride 545
- **● Hydrodechlorination**
- **Carboximidoyl Chlorides**
- with Pentacarbonyliron or Tetracarbonylferrates 782
- **3-Chloro-2-alkenals**
- by Catalytic Hydrogenation 235 (5135)
- **● Hydroiodination**
- C=C Double Bonds 708 (5281)
- **● Hydrolysis of Functional Groups**
- *gem*-Dihalo Compounds 9, 10, 11
- Nitriles 365
- **● Hydrosilylation**
- Ketones 233 (5131)
- **● Hydroxyalkylation**
- ***C*-(1-Hydroxyalkylation)**
- Replacement of Hydrogen 790 (5313)
- Replacement of Hydrogen via Metallation 939 (5358)
- ***C*-(2-Hydroxyalkylation)**
- Replacement of Hydrogen via Metallation 390
- ***N*-(2-Hydroxyalkylation)**
- Additive 2-Hydroxyalkylation 301
- ***O*-(2-Hydroxyalkylation)**
- Replacement of Hydrogen 223
- **● *C*-Hydroxycarbonylation**
- Replacement of Halogen via Metallation 33, 127
- Replacement of Hydrogen via Metallation 133
- **● *C*-Hydroxylation**
- Replacement of Halogen 93 (5094)
- Replacement of Hydrogen (Oxidative Hydroxylation) 215

- **● Insertion Reactions**
see also: Ring-Enlargement Reactions
- **C-Si Bonds**
- C–C–O Insertion 221
- **● Inversion of Configuration**
see: Stereoisomerization
- **● *C*-Iodination**
- Replacement of As-Functions 785 (5299)
- Replacement of Hydrogen 550 (5235)
- Replacement of Hydrogen via Metallation 159 (5104)
- Replacement of N-Functions 551 (5237)
- Replacement of O-Functions 405 (5181), 549 (5232), 550 (5233), 588
- Replacement of Other Halogens 19, 316, 435, 862 (5331), 875
- Replacement of S-Functions 370, 407 (5187), 727
- Replacement of Si-Functions 551 (5236)

- **● Japp-Klingemann Reaction** 445, 604, 864 (5336)

- **● Ketonic Cleavage** 228
- **● Knoevenagel Reaction** 178

- **● Lactonization**
- Hydroxyalkanoic Acids, Thermally or Catalytically 304
- Hydroxyalkanoic Acids, via Reactive Acid Derivatives 412 (5205)
- 4-Oxoalkanoic Esters + Base 225

- **● Meerwein Arylation** 238 (5144)
- **● Meisenheimer Rearrangement of Amine Oxides** 355
- **● *C*-Metallation**
- **Introduction of Copper**
- Replacement of Other Metals 37
- **Introduction of Lithium**
- Replacement of Halogen 27, 29, 31, 33, 707 (5279)
- Replacement of Hydrogen 35, 37, 149, 319 (5154), 828
- **● Michael Addition** 189, 589

- **● Nef Reaction** 324 (5167)
- **● Nitration**
- **Aromatic CH Groups**
- with Nitric Acid Esters 690
- **Olefinic CH and CH_2 Groups**
- with Nitric Acid 328 (5180)
- ***O*-Nitration**
- Alcohols 452

- **● Oxidation**
- **Electrochemical Oxidation**
- Sterically Hindered Phenols 852
- **with Benzeneperoxyseleninic Acid**
- Cycloalkanones 944 (5378)
- **with Bromine**
- Furan 144
- **with Carbenium Salts**
- Enol Silyl Ethers 859 (5320)
- **with Cerium(IV) Compounds**
- Alcohols 936
- **with Chloral**
- Secondary α-Thio- and α-Selenylalcohols 710 (5287)
- **with Chromium(VI) Compounds**
- 1-Alkenyl Ethers 792 (5318)
- 3-Arylselenylalkanols 860 (5323)
- 1,5-Diols 597
- Primary Alcohols 320 (5157), 534
- Secondary Alcohols 221, 320 (5157), 543, 597
- Tertiary Alcohols 162 (5114)
- Tertiary Allylic Alcohols 235 (5136), 236 (5138)
- Tetraalkylstannanes 788 (5307)
- **with Copper(II) Compounds**
- Diazonium Salts/Acid 234 (5132)
- **with Diacyloxyphenyliodine**
- Alkoxymagnesium Halides 790 (5312)
- **with Diazenedicarboxamides**
- Alkoxymagnesium Halides 790 (5311)
- Secondary Alcohols 488 (5229)
- **with Dimethyl Sulfoxide**
- Alcohols 297
- **with Dimethyl Sulfoxide/*N*-Halosuccinimides**
- Alkynes 723
- **with Disulfonyl Peroxides**
- Alkanamines 737
- **with Hexabutyldistannoxane/Bromine**
- Thioethers and Sulfenamides 163 (5118)
- **with *N*-Halosuccinimides**
- Alkoxymagnesium Halides 790 (5312)
- **with Hydrogen Peroxide**
- Amines 72 (5090)
- Penicillins and Cephalosporins 361
- Thioethers 214, 300
- **with Hydrogen Peroxide/Selenium Dioxide**
- Thioethers 758
- **with Iodine**
- Dihydrotelluroloquinolines 842
- **with Manganese(IV) Compounds**
- 2-Alkenols 621
- **with Nitronium Salts**
- Dialkyl Ethers 410 (5199)
- **with Organic Peroxoic Acids**
- Alkoxycarbonyl Disulfides 783
- Alkoxymagnesium Halides 790 (5312)
- ***S*-Heterocyclic Compounds 466**
- Alkoxycarbonyl Thiosulfinates 783
- Organoaluminum Compounds 709 (5285)
- Secondary Alcohols 239 (5147)
- 1,3-Thiazole Derivatives 745
- Thiols 729
- **with Oxygen or Air**
- 1-Alkenyl Ethers 67
- Bicyclic Enethiol Ethers 228
- **with Permanganate**
- 1-Alkynes 462
- 4,5-Dihydro-1,2,3-triazoles 694
- Non-Terminal Alkynes 462
- Tertiary Amines 743
- **with Quinones**
- 2-Alkenols 848
- Benzylazlactones 598
- **with Selenium Dioxide**
- 2-Methyl-2-alkenes 215
- **with Thallium(III) Compounds**
- Exomethylenebenzocycloalkenes 319 (5153)
- **● Oxidative Coupling**
- ***C*–*C* Coupling**
- Alkali-Metal Salts of *CH*-Acids + Ceric Ammonium Nitrate 472
- Alkyl Ketones, (1) Metallation, (2) $CuCl_2$ 324 (5168)
- Arenes + Thallium(III) Salts 323 (5164)
- Methyl Ketones + (1) Li diisopropylamide, (2) $CuCl_2$ 232 (5128)
- Nitroalkanes + (1) Lithium Methoxide, (2) Iodine 482 (5210)
- ***S*–*S* Coupling**
- Sulfinic Acids + Thiols + N_2O_4 712 (5293)
- Thiols + Air 670
- Thiols + Thiols + N_2O_4 712 (5293)
- **● *C*-(2-Oxoalkylation)**
- Reductive 2-Oxoalkylation of Arenes 589
- Replacement of Halogen 631 (5272)
- Replacement of O-Functions 21, 22
- **● Ozonization**
- Cycloalkenes 240 (5151)

- **● Perfluoroalkylation** 836
- **● Peptide Coupling**
- **Activated Acids + H_2N–**
- –CO–N_3 + H_2N– 915
- –CO–O–CO–OR + H_2N– 600
- –CO–O–N< + H_2N– 915
- –CO–SR + H_2N– 544, 720
- **Activated Acids + X–NH–**
- –CO–OR + Boc–NH– 750
- **–COOH + H_2N–**
- using Dicyclohexylcarbodiimide 915
- using Phosphorus(III) Reagents 488 (5227)
- using Phosphorus(V) Reagents 474
- **● *C*-Phosphonylation**
- Replacement of Halogen 131
- Replacement of Hydrogen 310

- **Phosphorylation**
- Alkyl Halides 770
- Enols 72 (5091)
- **Pictet-Spengler Reaction** 335
- **Pinacol Rearrangement** 358
- **Protection of Functional Groups**
- **Alcoholic –OH**
- by 2-Tetrahydropyranylation 388, 708 (5283)
- **>C=O**
- as Enolate Anion 555 (5250)
- by Acetalization 215
- **–COOH**
- by Esterification 711 (5290)
- **$-NH_2$**
- as 3,5-Dioxodihydro-1,2,4-dithiazoles 625 (5257)
- **–SH**
- by Alkylation 714
- by Disulfide Formation 714
- by Thiocarbamate Formation 714
- **Protective Groups, Cleavage**
- **–COOH-Protecting Groups**
- 1-Methoxycarbonyl-3-oxopropyl Group 711 (5290)
- ***N*-Protecting Groups**
- *N*-Alkoxycarbonyl Groups 750, 751
- Boc Group 46, 76 (5103)
- 3,5-Dioxodihydro-1,2,4-dithiazoles 625 (5257)
- ***O*-Protecting Groups**
- Benzyl Esters 76 (5103)
- **Pummerer Reaction** 209, 881

- **Ramberg-Bäcklung Reaction** 733
- **Reduction**
- **Catalytic Hydrogenation using Cyclohexene as Hydrogen Donor**
- Acetals 825
- Aldehydes and Ketones 159 (5106)
- Arylcarbinols 397
- Ethers 825
- Peptide Derivatives 76 (5103)
- Peptide Resin Esters 750
- **Catalytic Hydrogenation using Hydrazine as Hydrogen Donor**
- *N*-Protected Peptides 751
- **Catalytic Hydrogenation with Elemental Hydrogen**
- 2-Alkenals 235 (5135)
- Alkenolides 225
- Azido Compounds 24
- Bicyclic Iminium Salts 701
- Catechol Ethers 223
- Cyclopentenes 150
- 3,4-Dehydro-α-tocotrienol 888
- Imines 331
- Non-conjugated Enones 225
- **Electrochemical Reduction**
- 2-Alkenoic Esters + Carboxylic Anhydrides 792 (5317)
- Sugars and Derivatives 42
- **with Aluminum Amalgam/Protic Systems**
- Nitroalkanes 484 (5216)
- unsaturated Diazalactones 332
- **with Aluminum-Nickel Alloy (Raney Nickel)/Aqueous Base**
- Aryl Hydrogen Sulfate Salts 737
- **with Aluminum/Protic Systems**
- –α-Sulfinylcarboxylic Acids 163 (5117)
- **with Amine-Boranes**
- Phthalazines 447
- Quinolines 447
- **with Borane (Diborane)**
- Aldehydes and Ketones 352
- Carboxylic Acids 752
- Lactams 156, 223
- *N*-Substituted Carboxamides 752
- **with Boranes (organic)**
- Aldehydes and Ketones 160 (5108), 862 (5332)
- **with Complex Aluminum Hydrides**
- Aldehydes and Ketones 352
- 2-Alkenoic Esters 620
- 2-Alkenyl Carboxylates 419
- 1-Alkynyl Ketones 938 (5356)
- 1-Alkynyl Aryl Sulfides 285
- Arsine Oxides 785 (5299)
- Carboxamides 933
- Dithiocarbamic Esters 164 (5121)
- 1-Halo-1-alkenyl Ketones 320 (5155)
- 2-Halo-2-alkenals 320 (5155)
- 2-Hydroxydihydropyrans 210
- Lactams 156, 685
- Oxocycloalkenecarboxylic Esters 364
- 11-Oxosteroids 555 (5250)
- 1,1,2-Trifluoro-1-alkenes 128
- **with Complex Borohydrides**
- ***C*-Acyl-*N*-heterocycles** 448
- Aldehydes and Ketones 352, 891
- Alkanenitriles 548
- 2-Alkenenitriles 72 (5089)
- *N*-Alkylidenephosphinamides 522
- Alkylmercury Halides 914
- Alkyl Sulfonates 71 (5086)
- Carboxylic Acids + Secondary Amines 766
- Aryl Azidosulfates 357
- Diaryl Ketones 763
- 2,5-Dihydro-1,3-oxazoles 549 (5230)
- Ketones + Primary Amines 766
- Monohydrazones of *vic*-Diketones 485 (5219)
- Nitriles 156
- Nitrimines 787 (5302)
- Nitrostyrenes 484 (5216)
- Sulfonic Acid Imides 736
- **with Dialkylalanes**
- 3-Acyltetrahydro-1,3-thiazoles 941 (5366)
- Lactones 418, 423
- **with Diazenes**
- Alkenes 736
- **with Formamidinesulfinic Acid**
- Sulfoxides 542
- **with Formic Acid**
- 2-Alkenenitriles 486 (5222)
- Alkylidenemalodinitriles 486 (5222)
- **with Hydrazine**
- Nitroarenes 834
- **with Iron/Acid**
- Dinitroarenes 924
- **with Liquid Paraffin**
- Nitro Compounds 23
- **with Metal Carbonyls or Carbonylmetallates**
- Carboxamides 711 (5292)
- Thioketones 711 (5292)
- **with Phosphines**
- 1-Alkoxyalkyl Hydroperoxides 67
- *gem*-Hydroperoxy-siloxy Compounds 550 (5234)
- Sulfoxides 137
- **with Phosphorous Acid Esters**
- Oxoalkanoic Esters 405 (5182)
- **with Phosphorus(III) Halides**
- 1-Nitroalkanes 632 (5275)
- **with Phosphorus(V) Sulfide**
- Sulfilimines 540
- **with Silanes**
- Aldehydes and Ketones 350
- Oxoalkanoic Esters 233 (5131)
- **with Sodium Amalgam/Protic Systems**
- Alkyl Aryl Sulfones 731
- **with Sodium Hydrogen Telluride**
- Alkenes 546
- **with Stannanes**
- ***O*-Alkyl Thiocarboxylates** 716
- **with Titanium(II) Salts**
- Sulfoxides 138
- **with Titanium(III) Salts**
- Azido Compounds 65
- Nitroalkanes 484 (5216)
- **with Zinc/Protic Systems**
- Sulfuranes 710 (5289)

- **Reductive Coupling**
- ***C–C* Coupling**
- Aldehydes or Ketones + Allyl Halides or Tosylates + Chromium(II) Salts 162 (5115)
- Alkylidenemalodinitriles, electrochemically 174
- Alkynes + (1) Chloroborane + (2) Methylcopper 549 (5231)
- α-Bromocarbonyl Compounds + Aldehydes or Ketones + Dialkylaluminum Chloride / Zn/CuBr 628 (5264)
- Carboxylic Acids + Alcohols (indirect multistage coupling) 549 (5230)
- Haloarenes + Sodium Formate + Aqueous Sodium Hydroxide + Pd–C 537
- *C*-Halo Compounds + Electrochemically Generated Chromium(II) 901
- α-Haloketones + Metal Carbonyls 406 (5184)
- 2-Phenyliminophenylacetonitriles + Lithium or Sodium 894
- Thioketones + Cobalt Carbonyls 711 (5292)
- ***C–N* Coupling**
- Secondary Amines + Alcohols + H_2/cat. 71 (5088)
- ***O–Si* Coupling**
- 1-Haloalkyl Ketones + Chlorotrimethylsilane + Zinc 164 (5122)
- ***S–S* Coupling**
- Thiols + Bromine 50
- **Reductive Cyclization (intramolecular)**
- **General, C → C**
- 4- and 5-Alkenyl Ketones, Electrochemical Reduction 861 (5327)
- Dicarbonyl Compounds + $TiCl_3$/Zn–Cu 405 (5183)
- 1,n-Diiodo Compounds + Sodium 435
- Epoxyalkenones + Hydrazine 628 (5266)
- **C_3 Ring**
- Br–C–C=C + $NaBH_4$ 531
- **Resolution of Optical Isomers**
- α-Aminocarboxylic Acids and Derivatives 328 (5180)
- **Ring-Contraction Reactions**
- **Elimination of C to give S–C–C–C–C**
- via Schmidt Reaction of Cyclic Ketones 211
- **Elimination of N–N to give C_3**
- Thermally 100, 101
- **Elimination of O–S to give C_3**
- Photolytical Elimination of SO_2 from 3-Alkanesultones 579
- **Elimination of S to give C_3**
- by Sulfone Contraction 579
- **Elimination of S to give C_7**
- by Sulfone Contraction 214
- **Ring-Enlargement Reactions**
- **C-Insertion, General**
- Cycloalkanones + Dihalomethyllithium 233 (5129) (5130)
- 1-Dibromomethylcycloalkanols, Rearrangement 233 (5130)
- Exomethylenebenzocycloalkenes + $Tl(NO_3)_3 \cdot 3H_2O$ 319 (5153)
- **C–C Insertion, General**
- *N*-Phenyllactams, Photochemical Rearrangement 497
- **C-Insertion to give C_4**
- by Rearrangement 16, 17, 237 (5143), 821
- **C-Insertion to give C_5**
- Dewar Benzenes + Dichlorocarbene 82
- **C-Insertion to give C_7**
- Arenes + Dichlorocarbene 82
- Cyclohexanones + Diazoalkanes 93
- **C-Insertion to give S–C–C–N–C–C**
- 2-Alkyl-1,3-thiazole 1-Oxide Derivatives + Acid 745
- **N-Insertion to give O–C–C–N–C–C–C**
- 3-Carboxychromones + Hydroxylamine 780

- **N-Insertion to give S–C–C–N–C–C–C**
- via Schmidt Reaction of Cyclic Ketones 211
- **O-Insertion**
see: Baeyer-Villiger Reaction
- **Se Insertion to give S–Se–C–N–C**
- 1,3-Thiazetes + P_2Se_5 44

- **Schmidt Reaction of Cyclic Ketones** 211
- **[2,3]-Sigmatropic Rearrangements** 939 (5361)
- **Silylation**
- ***C*-Silylation**
- Replacement of Hydrogen via Metallation 319 (5154), 486 (5223)
- ***O*-Silylation**
- Reductive *O*-Silylation of Carbonyl Groups 164 (5122)
- Replacement of Alkyl Groups 550 (5233), 609
- Replacement of Hydrogen 487 (5225)
- **Simmons-Smith Reaction** 86
- **Spin Labelling**
- Amino Acids and Derivatives 914
- ***C*-Stannylation**
- Reductive Stannylation of C=C Groups 788 (5307)
- **Stereoisomerization**
- **Epimerization**
- Thermal or Catalytic Epimerization 904
- **Inversion of Configuration at Single Asymmetric Centers**
- Chemical Inversion 73 (5093)
- ***cis/trans*-Isomerization of Olefinic Compounds**
- Photochemical Isomerization 741
- **Stevens Rearrangement** 355
- **Stobbe Condensation** 791 (5315)
- **Strecker Synthesis** 552 (5239)
- ***O*-Sulfinylation**
- Replacement of Hydrogen 783
- ***N*-Sulfonylation**
- Replacement of Hydrogen 646

- ***C*-Thiolation**
- Replacement of Halogen 19, 714
- **Transacylation, intramolecular**
- Photochemical Rearrangement of *N*-(1-Alkenyl)-carboxamides 495
- **Transalkylation**
- Alkylquinol Ethers + Arenes 399
- Arenes + Alkylarenes 214, 435
- **Transamination** 330
- **Transannular Reactions**
- Benzocycloheptenes + Malodinitrile 245
- **Transesterification**
- **Carboxylic Esters**
- with Alcohols or Phenols 549 (5230)
- with *t*-Butylthiodimethylaluminum 943 (5374)
- **Phosphoric Esters**
- with Alcohols or Phenols 327 (5177)
- **Phosphorous Esters**
- Three-Stage Transesterification 135
- **Translactonization**
- Rearrangement of ω-Hydroxyalkanolides 632 (5276)
- ***C*-Trifluoromethylation**
- Replacement of N-Functions 937 (5352)

- **Vilsmeier Reaction** 161 (5112)

- **Williamson Ether Synthesis** 630 (5271)
- **Wittig Ether-Carbinol Rearrangement** 320 (5156), 355
- **Wittig-Horner Reaction**
see: Carbonyl Olefination
- **Wittig Reaction**
see: Carbonyl Olefination

INDEX OF SPECIAL REAGENTS

- **Acetylacetonato-[(-)-*N*-alkylephedrinato]-dioxomolybdenum Complexes**
- Preparation and Use as Oxidation Catalyst 76 (5101)
- **Acetyl Hexachloroantimonate**
- Use as Acetylating Agent 787 (5305)
- **Acetyl-thiourea**
- Use as S Source 714
- **1-Acyl-4-benzylidene-1,4-dihydropyridines**
- Preparation and Use as Acylating Agents 587
- **Aliquat 336**
- Use as Phase-Transfer Catalyst 366
- **Aluminum Selenide**
- Use as Se Source 668
- **Azidotributylstannane**
- Use as Azido-Group Transfer Agent 488 (5228)
- **Azidotrimethylsilane**
- Use in Reductive Amination 553 (5242)

- **Benzeneseleninic Acid**
- Use as Oxidation Catalyst 300
- **Benzeneseleninic Acid Anhydride**
- Use in Cleavage of Hydrazones 323 (5166)
- **Benzyl Carbamate**
- Use as NH_2 Synthon 479
- **3-Benzyl-5-(2-hydroxyethyl)-4-methyl-1,3-thiazolium Chloride**
- Use as Catalyst 942 (5370)
- **Bis[4-nitrophenylsulfonyl] Peroxide**
- Use as Oxidizing Agent 737
- **Bis[piperidinocarbonyl]-diazene**
- Use as Oxidizing Agent 488 (5229), 790 (5311)
- **Bis[tributylstannyl] Peroxide**
- Use as O–O Synthon 75 (5098)
- **Bis[trimethylsilyl] Sulfide**
- Use as S-Synthon 562
- **1,3-Bis[trimethylsilylthio]-propane**
- Use as Cyclothioacetalization Reagent 239 (5149)
- **9-Borabicyclo[3.3.1]nonane (9-BBN)**
- Use as Hydroborating Agent 322 (5162), 712 (5294)
- Use as Reducing Agent 160 (5108), 862 (5332)
- ***N*-Bromoacetamide**
- Use as Brominating Agent 217
- **3-Bromo-2-methoxypropene**
- Preparation 485 (5218)
- Use as 2-Oxopropyl Synthon 485 (5218), 631 (5272)
- ***N*-Bromosuccinimide**
- Use as Brominating Agent 159 (5104), 625 (5256), 696, 708 (5281)
- ***t*-Butyl Hypochlorite**
- Use as Chlorinating Agent 76 (5102), 240 (5152)
- ***t*-Butyl Peroxybenzoate**
- Use as Alkoxylating Agent 679
- ***t*-Butylthiodimethylaluminum**
- Use as Alkylthio Synthon 943 (5374)

- ***N,N'*-Carbonyldiimidazole**
- Use for Preparing Reactive *N*-Acylimidazoles 478
- **Chiral Reagents**
- **Chiral Additives in Asymmetric Synthesis**
- in Reduction Reactions 332, 352, 938 (5356)
- **Chiral Catalysts**
- Hydrogenation Catalysts 233 (5131), 333, 343
- Oxidation Catalysts 76 (5101)
- **Chiral Reaction Components in Asymmetric Synthesis**
- Acetic Acid Synthon 163 (5117)
- Amino Acids 325 (5172)
- α-Hydroxycarboxylic Acid Synthons 237 (5141)
- Primary Amines as NH–R Synthons 552 (5239)
- **Chlorocarbonylsulenyl Chloride**
- Use as O–C–S Synthon 625 (5257)
- **2-Chloro-3-ethyl-1,3-benzoxazolium Tetrafluoroborate**
- Use as Chlorinating Agent 707 (5278)
- Use as Dehydrating Agent 411 (5201)
- Use for OH/Cl Exchange 407 (5188)
- **2-Chloro-3-methoxymethyl-1-methylpyridinium Iodide**
- Use as Carboxy-Activating Agent 412 (5205)
- **2-Chloro-1-methylpyridinium Iodide**
- Use as OH-Activating Agent 441, 730, 867 (5347), 941 (5366)
- Use as Dehydrosulfurizing Agent 164 (5119), 239 (5148)
- ***N*-Chlorosuccinimide**
- Use as Chlorinating Agent 159 (5104), 625 (5256)
- Use as Oxidizing Agent 790 (5312)
- **Chromyl Chloride**
- Use as Oxidizing Agent 320 (5157)
- **Copper(I) Alkyltrifluoroborates**

- Preparation and Use 708 (5282)
● **Crown Ethers**
- Preparation 688
- Use as Catalysts 700
- Use as Phase-Transfer Agents 551 (5237)
- Use as Solubilizing Agents 868 (5349)
● **Cyanogen Bromide**
- Use as Brominating Agent 159 (5104)
● **Cyanogen Iodide**
- Use as Iodinating Agent 159 (5104)
● **Cyclohexene Oxide**
- Use as Hydrogen Halide Scavenger 231 (5125)
● **Cyanotrimethylsilane**
- Generation *in situ* 219
- Use in Cyanohydrine Synthesis 219

● **Darvon Alcohol**
- Use as Chiral Additive 938 (5356)
● **Diacetoxyphenyliodine (Iodosobenzene Diacetate)**
- Use as Oxidizing Agent 790 (5312)
● **1,5-Diazabicyclo[4.3.0]non-5-ene (DBN)**
- Use as Base 632 (5276), 879
● **1,8-Diazabicyclo[5.4.0]undec-7-ene (DBU)**
- Use as Base 76 (5102), 240 (5251), 461, 842
● **Dibromoborane: Dimethyl Sulfide**
- Use as Hydroborating Agent 482 (5211)
● **5,5-Dibromo-2,2-dimethyl-4,6-dioxo-1,3-dioxan**
- Preparation and Use as Brominating Agent 141
● **2,6-Di-*t*-butyl-4-methylphenol**
- Use as *t*-Butylating Agent 214
● **2,3-Dichloro-5,6-dicyano-*p*-benzoquinone (DDQ)**
- Use as Oxidizing Agent 848
● **Dichloromethyl Methyl Ether**
- Use as Formylating Agent 629 (5269)
● **Dicyclohexylcarbodiimide**
- Use as Condensing Agent (Dehydration) 395
- Use in Peptide Coupling 544
● **Di-η^5-cyclopentadienylchlorozirconium(IV)**
- Use in *C*–*C* Coupling 626 (5258)
● **Dicyclopentadienyltitanium(IV) Chloride**
- Use 709 (5285)
● **Diethyl *t*-Butoxycyanomethanephosphonate**
- Use as Carbonyl-Olefinating Agent 161 (5110)
● **Diethyl Diazenedicarboxylate/Triphenylphosphine**
- Use as Auxiliary Reagent in Esterification 441
● **Diethyl Phosphorobromidate**
- Preparation 474
- Use in Amide Formation and Peptide Coupling 474
● **Diethyl Phosphorocyanidate**
- Use as Condensing Agent 325 (5172)
● **Diethyl Trimethylsiloxycarbonylmethanephosphonate**
- Preparation and Use in Carbonyl Olefination 131
● **Dimethylformamide Diethyl Acetal**
- Use as Aminocarbonyl Synthon 864 (5338)
- Use as C-Synthon 843
● ***N,N*-Dimethylmethaniminium Iodide**
- Use as Aminomethylating Agent 72 (5090), 236 (5140)
● **Dimethyl Sulfoxide**
- Use as Oxidizing Agent 297
● **Dimsylsodium ($NaCH_2–SO–CH_3$)**
- Use as C-Synthon 209, 723
● **2,4-Dinitrobenzeneseleninic Acid**
- Use as Oxidation Catalyst 300
● **2,4-Dinitrophenyl Dihydrogen Phosphate Mono-quinuclidine Salt**
- Preparation 601
● **2,4-Dinitrophenyl Dihydrogen Phosphate**
- Preparation and Use as Phosphorylating Agent 602
● **DIOP (2,3-Isopropylidenedioxy-1,4-bis-[diphenylphosphino]-butane)**
- Use as Chiral Ligand 233 (5131), 333
● **2,3-Dioxo-5,7-diphenyl-2,3-dihydrothieno[3,4-*b*][1,4]dioxin 6,6-Dioxide**
- Preparation and Use as Carboxy-Activating Agent 622
● **4,6-Diphenyl-1-hydroxy-2-oxo-1,2-dihydropyridine**
- Use 866 (5345)
● **Diphenyl Phosphoroazidate**
- Use for OH/N_3 Exchange 232 (5127)
● **Diphenyl Phosphorochloridate**
- Use as Phosphorylating Agent 72 (5091)
● **1,3-Dithiane**
- Use as C-Synthon 716, 718

● **Ethoxycarbonyl Isothiocyanate**
- Use for O/S Exchange 831
● **Ethoxyvinyllithium**
- Use as Acetaldehyde Equivalent 941 (5367), 942 (5368)
● ***N*-Ethyl-*N'*-(3-dimethylaminopropyl)-carbodiimide**
- Use as Condensing Agent (Dehydration) 395
● **3-Ethyl-2-fluoro-1,3-benzothiazolium Tetrafluoroborate**
- Use in Inversion of Optically Active Alcohols 73 (5093)
● **3-Ethyl-5-(2-hydroxyethyl)-4-methyl-1,3-thiazolium Bromide**
- Use as Catalyst 942 (5370)
● **Ethylthiotrimethylsilane**
- Use as Thioacetalization Reagent 239 (5149), 325 (5170)

● **2-Fluoro-1-methylpyridinium Tosylate**
- Use as OH-Activating Agent 75 (5100), 164 (5121)
● **Formamidinesulfinic Acid**
- Use as Reducing Agent 542
● **2-(*N*-Formyl-*N*-methylamino)-pyridine**
- Preparation and Use as Formylating Agent 403

● **Hagemann Ester**
- Homologation 364
● **Hexabutyldistannoxane/Bromine**
- Use as Oxidizing Agent 163 (5118)
● **Hexaethylphosphorous Triamide**
- Use as P-Synthon 559
● **Hexamethyldisilazane**
- Use as Condensing Agent 614
● **Hydroxylamine-*O*-sulfonic Acid**
- Use as Diazotization Reagent 937 (5353)

● **Iodine Selenocyanate**
- Generation and Use 152
● ***N*-Iodosuccinimide**
- Use as Iodinating Agent 696
● **Iodotrimethylsilane**
- Use as Iodinating Agent 405 (5181), 549 (5232), 550 (5233)

● **Meldrum Acid (2,2-Dimethyl-4,6-dioxo-1,3-dioxan)**
- Use as Malonic Acid Synthon 386
● **2-Mercapto-4,5-dihydro-1,3-thiazole**
- Use in the Synthesis of Reactive Intermediates 407 (5187)
● **Mercury-impregnated Resins**
- Preparation and Use 671
● **2-Methoxy-3-phenylthiobutadiene**
- Use as C_4 Synthon in Diels-Alder Syntheses 159 (5105)
● ***N*-Methylanilinotriphenylphosphonium Iodide**
- Use as Auxiliary Reagent in Stereospecific Reductive Alkylations of Alcohols with Organocuprates 231 (5123)
● **Methyl 2-Chloro-3-oxobutanoate**
- Use in Protection of Carboxy Groups 711 (5290)
● **Methyl Fluorosulfate**
- Use as Methylating Agent 46
● **Methyl Methylthiomethyl Sulfoxide**
- Use as Formyl Synthon 555 (5248), 725
● **Methylthiotrimethylsilane**
- Use as Thioacetalization Reagent 239 (5149), 719

● **Nafion-H**
- Use as Solid Acidic Catalyst 358, 929
● **2-Nitrobenzeneseleninic Acid**
- Use as Oxidation Catalyst 300
● **Nitronium Tetrafluoroborate**
- Use as Nitrating Agent 452
- Use as Oxidizing Agent 410 (5199)
● **Nitrosotrifluoromethane**
- Use in Trifluoromethylation 937 (5352)
● **1-Nitro-2,4,6-trimethylpyridinium Tetrafluoroborate**
- Generation and Use as Nitrating Agent 452

● **Octacarbonyldicobalt**
- Use as Hydrodebrominating Agent 406 (5184)
- Use as Reducing Agent 711 (5292)

● **Pentacarbonyliron/Base**
- Use as Reducing Agent 711 (5292)
● **2-Phenoxy-1,3,2-dioxaphospholane**
- Use as Reducing Agent 405 (5182)
● ***S*-Phenyl Benzenethiosulfonate**
- Use as Phenylsulfenylating Agent 629 (5267)
● **Phenylselenyl Bromide**
- Use as Brominating Agent 551 (5238), 626 (5260)
● **Phenylthiotrimethylsilane**
- Use as Thioacetalization Reagent 325 (5170)
● **Polymer-Halogen Complexes**
- Preparation and Use 50
● **Polymer-Linked Phosphonium Salts**
- Preparation 315
- Use as Phase-Transfer Catalysts 234 (5133), 315, 326 (5175)
● **Polymer-Linked Sulfonic Acids**
- Use 672
● **2-Polyvinylpyridine-Bromine Complex**
- Preparation and Use as Oxidizing Agent 50
● **Potassium 3-Aminopropylamide**
- Use as Base 231 (5124), 754
● **Potassium Triflinate**
- Preparation 729
● **Pyridinium Chlorochromate**
- Use as Oxidizing Agent 162 (5114), 212, 235 (5136), 237 (5138)
● **Pyridinium Tosylate**
- Use as Catalyst 708 (5283)

● **Resinsulfonic Acids**
- Use 929
● **Rose Bengal**
- Use as Photosensitizer 228

● **Silica Gel-Supported Reagents**
- **Chromic Acid on Silica Gel**
- Preparation and Use as Oxidizing Agent 534
● **Silver Triflate**
- Use in Substitution of Chlorine by Other Groups 408 (5191), 735

- **Singlet Oxygen**
  - Generation and Use 67, 228
- **Sodium 3-Aminopropylamide**
  - Use as Base 231 (5124)
- **Sodium Borohydride on Alumina**
  - Use as Reducing Agent 891
- **3-Sulfopropanoic Anhydride**
  - Use as Condensing Agent 678
- **Sulfur Dioxide, Liquid**
  - Use as Solvent 326 (5173)
  - Use for Isomerization of Alkenes 321 (5160)

- **2,4,4,6-Tetrabromocyclohexadienone**
  - Use as Bromohydroxylating Agent 605
  - Use as Oxidizing Agent 605
- **Tetrabutylamonium-Di-*t*-butyl Phosphate**
  - Preparation and Use as Phosphorylating Agent 770
- ***meso*-Tetraphenylporphin**
  - Use as Photosensitizer 68
- **Thexylborane-Triethylamine**
  - Use as Hydroborating Agent 146
- ***N,N'*-Thiocarbonyldiimidazole**
  - Preparation 809
- **Thiophosgene (Thiocarbonic Dichloride)**
  - Preparation and Survey of Uses 803
- **2-Thioxotetrahydro-1,3-thiazole**
  - Use in Conversion of Carboxylic Acids 941 (5366)
- **Tosylmethyl Isocyanide**
  - Use as Cyano Synthon 411 (5202)
- **Triethyl Trithioborate**
  - Use as Transesterification Reagent 411 (5203)
- **Triflic Acid (Trifluoromethanesulfonic Acid)**
  - Use as Sulfonyloxylating Agent 735
- **Triflic Anhydride (Trifluoromethanesulfonic Acid Anhydride)**
  - Preparation and Use as Sulfonylating Agent 735
- **2-Triflyoxypyridine**
  - Use as Condensing Agent 789 (5310)
- **2,4,6-Triisopropylphenylsulfonylhydrazine**
  - Use as Reducing Agent (via Diazene) 736
- **Triphenylphosphine/Hexachloroacetone**
  - Use for OH/Cl Exchange 481 (5208)
- **Triphenylphosphine/Hexachloroethane**
  - Use in Amide Formation and Peptide Coupling 488 (5227)
- **Triphenylphosphine Thiocyanate**
  - Use as Thiocyanation Reagent 868 (5350)
- **Trityl Tetrafluoroborate**
  - Use as Oxidizing Agent 859 (5320)

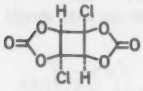
INDEX OF APPARATUS, LABORATORY TECHNIQUES, ETC.

- **Electrochemical Methods**
  - Electrochemical Alkoxylation 283
  - Reduction with Electrochemically Continuously Regenerated Chromium(II) 901
- **Electrolysis Cells**
  - Undivided Cells for Oxidation of Sterically Hindered Phenols 852

- **Phase-Transfer Catalysis**
  - **Liquid/Liquid**
    - addition of hydrogen sulfide to nitriles in an aqueous-organic two-phase system containing quaternary aminium salts 917
    - *C*-alkylation with alkyl halides in an aqueous-organic two-phase system containing quaternary aminium salts 823, 883, 937 (5354)
    - *N*-alkylation with alkyl halides in an aqueous-organic two-phase system containing quaternary aminium salts 787 (5303), 882, 944 (5377)
    - *O*-alkylation with alkyl halides in an aqueous-organic two-phase system containing quaternary aminium salts 939 (5361)
    - *S*-chloromethylation of thiols with bromochloromethane in an aqueous-organic two-phase system containing quaternary aminium salts 868 (5351)
    - condensation of phenylacetonitriles with nitrosobenzenes in an aqueous-organic two-phase system containing quaternary aminium salts 892
    - esterification of *O*-alkyl potassium dithiocarbonates with alkyl halides or mesylates in an aqueous-organic two-phase system containing quaternary aminium salts 366
    - ether cleavage with hydrogen bromide in an aqueous-organic two-phase system containing quaternary phosphonium salts 711
    - *O,O*-methylenation in an aqueous-organic two-phase system containing quaternary aminium salts 48
    - oxidation with potassium permanganate in an aqueous-organic two-phase system containing quaternary aminium salts 462
    - reaction of diazonium salts with halogenating agents in an aqueous-organic two-phase system containing crown ethers 551 (5237)
    - various substitution reactions in an aqueous-organic two-phase system containing polymer-linked phosphonium salts 316
  - **Solid/Liquid/Liquid**
    - debromination of *vic*-dibromoalkanes with sodium thiosulfate in a three-phase system containing polymer-linked aminium salts 234 (5133)
    - X/CN exchange with sodium cyanide in a three-phase system containing polymer-linked aminium salts 326 (5175)
- **Photochemical Methods**
  - Photosensitization 67, 228
- **Three-Phase Reactions**
  see: Phase-Transfer Catalysis
- **Two-Phase Reactions**
  see also: Phase-Transfer Catalysis
  - reactions of tosylhydrazones in alkaline aqueous-organic two-phase systems 481 (5207)

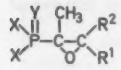
Errata 1978

A. H. Schmidt, W. Ried, *Synthesis* **1978** (1), 1–22;
The structure for product **17a** (p. 3) should be:



17a

P. Coutrot, P. Savignac, *Synthesis* **1978** (1), 34–36;
The structure for product **3** (p. 35) should be:

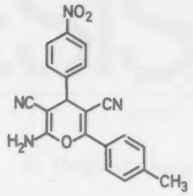


3

K. Burger, R. Ottlinger, *Synthesis* **1978** (1), 44;
Compounds **3** should be named 5-aryl-3,3-bis[trifluoromethyl]-3*H*-1,2,4-thiaselenazoles.

F. Huet, A. Lechevalier, M. Pellet, J. M. Conia, *Synthesis* **1978** (1), 63–65;
The first two entries in the Table (p. 64) should be:

A. J. Fatiadi, *Synthesis* **1978** (4), 241–282;
The formula for product **346** (p. 273) should be:



346

P. Tundo, *Synthesis* **1978** (4), 315–316;
The title and first sentence of the fifth experimental procedure (p. 316) should read as follows:

Preparation of *n*-Octyl Phenyl Sulphide from 1-Bromooctane and Potassium Benzenethiolate:
1-Bromooctane (19.30 g, 100 mmol), dichloromethane (50 ml), and resin **3** (1.20 g corresponding to 1.0 mmol of phosphonium salt) are stirred for 15 min at 20° to condition the resin; then a 3.0 molar aqueous solution of potassium benzenethiolate (50 ml, corresponding to 150 mmol of C_6H_5SK) is added and stirring is continued for 2.0 h.

Abstract no. 5171, *Synthesis* **1978** (4), 325;
The title should be:
Synthesis of Alkanoic, Arylacetic, and 3-Alkenoic Acids

C. Giordano, A. Belli, V. Bellotti, *Synthesis* **1978** (6), 443–445;
The pressures of hydrogen sulphide given in the experimental procedures (pp. 444–445) should be 1.2 ata (912 torr).

Table. Hydrolysis of Various Saturated and Unsaturated Acetals using Wet Silica Gel.

Entry	Acetal	Carbonyl Compound[a]	Method	Reaction time[b]	Yield [%]	Other method	Yield [%]	m.p. or b.p./torr (Lit. m.p. or b.p./torr)
1			B	3 h	98	—	—	130–131°/760 (130.6°/760)
2			A B	24 h 0.5 h	73 77	H_2O/H_2SO_4	65[4]	61°/24 (68.5–69°/23)[4]

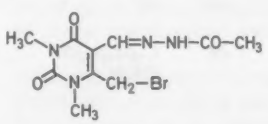
A. J. Fatiadi, *Synthesis* **1978** (3), 165–204;
On page 185, the first paragraph in the right hand column and the heading for Table 5 should read as follows:
Recently Zacharias and Junek[153] extended the related study to include 2-phenylhydrazone derivatives. Thus, reaction of 2-phenylhydrazones of 1,2,3-cyclohexanetriones with malononitrile produced 3-amino-4-cyano-8-dicyanomethylene-2-phenyl-2,8-dihydrocinnolines (50–54% yield, Table 5). Similar treatment of 2-phenylhydrazones of 1,2,3-indanetrione, however, gave 4-cyano-9-dicyanomethylene-3-imino-2-phenyl-2,3-dihydro-9*H*-indeno[2,1-*c*]pyridazines (69–90% yield, Table 6). The plausible pathways of the product formation are shown in the following Tables.

Table 5. Synthesis of Dihydrocinnolines via Reaction of 2-Phenylhydrazones of 1,2,3-Cyclohexanetriones with Malononitrile[153]

R	m.p.	Yield [%] of dihydrocinnoline

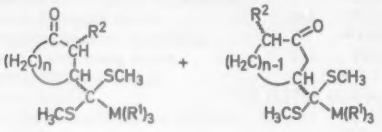
M. Suzuki, K. Nunami, K. Matsumoto, N. Yoneda, M. Miyoshi, *Synthesis* **1978** (6), 461–462;
The correct name for compound **4c** should be as follows:
8-hydroxy-7-methoxycarbonyl-5-oxo-5,6-dihydro-1,6-naphthyridine.

S. Senda, K. Hirota, T. Asao, Y. Yamada, *Synthesis* **1978** (6), 463–465;
The formula for compound **4** (p. 464) should be:



4

Abstract no 5213, *Synthesis* **1978** (6), 483;
The structures for products **8** and **9** should be:



8 **9**

Abstract no. 5254, *Synthesis* **1978** (7), 556;
The title should be:
Reaction of 1-Ethoxy-1-trimethylsiloxycyclopropane with Carbonyl Compounds

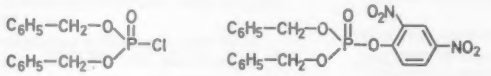
J.-P. Majoral, *Synthesis* **1978** (8), 557–576;
Sub-heading 4.2.1. (p. 565) should read:
4.2.1. 3,4-Dihydro-2*H*-1,2,3-diazaphospholes
The products **83** (p. 569) should be named:
3,4-Dihydro-2*H*-1,2,4,5,3-tetraazaphosphepin derivatives
The products **84** (p. 569) should be named:
2,3,5,6,4-benzotetraazaphosphonin derivatives

J. D. Finlay, D. J. H. Smith, T. Durst, *Synthesis* **1978** (8), 579–580;
The compounds **1** should be named:
5-phenyl-1,2-oxathiolane 2-oxides.

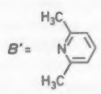
G. Sosnovsky, M. Konieczny, *Synthesis* **1978** (8), 583–585;
The heading for the first experimental procedure (p. 584) should read:
1-Oxyl-2,2,6,6-tetramethyl-4-piperidyl *N*,*N*-(1,2-Ethanediyl)-benzenephosphonoamidite (7a):

F. Hordziejewicz, Z. Skrowaczewska, *Synthesis* **1978** (8), 585–586;
The heading for the first experimental procedure (p. 586) should read:
Purification of Commercial 2,6-Lutidine:

F. Ramirez, J. F. Marecek, *Synthesis* **1978** (8), p. 601–603;
In Scheme **A** (p. 602) the structures of compounds **5**, **6**, and *B'* should be:

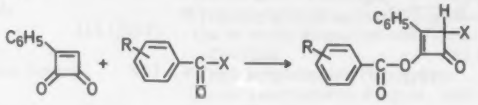


5 **6**



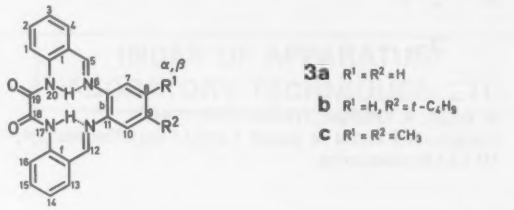
A. R. Katritzky, S. B. Brown, *Synthesis* **1978** (8), 619–620;
The heading for the first experimental procedure (p. 619) should read:
2'-Methoxycarbonylbenzanilide:

H. Knorr, W. Ried, *Synthesis* **1978** (9), 649–666;
The formula for the formation of product **86** (p. 661) should be:



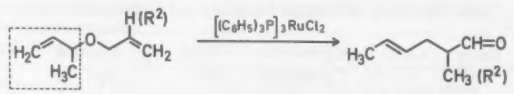
86

C. Skötsch, E. Breitmaier, *Synthesis* **1978** (8), 680–681.
The numbering for compounds **3a–c** (see Scheme p. 680) should be as shown below:



3a $R^1 = R^2 = H$
b $R^1 = H$, $R^2 = t\text{-}C_4H_9$
c $R^1 = R^2 = CH_3$

Abstract no. 5309, *Synthesis* **1978** (10), 789;
The title and formula **1**→**2** should be as follows:
Ruthenium(II) Catalysed Synthesis of γ,δ-Unsaturated Aldehydes



1 **2**

S. Sharma, *Synthesis* **1978** (11), 803–820;
Product **24** (p. 807) should be named:
12-Oxo-12*H*-benzimidazo[2,1-*b*][1,3]-benzoxazine
and product **28** (p. 807) should be named:
2-thioxo-2,5-dihydroimidazole 3-oxide

F. M. F. Chen, K. Kuroda, N. L. Benoiton, *Synthesis* **1978** (12), 928–929;
The 4th, 5th, and 6th entries in the Table (p. 928) should be:

Amino Acid	R^2	*N*-Benzyloxycarbonyl derivatives **4a** Yield [%]	m.p. (dec)	Lit. m.p. or Molecular formula[a]	$[\alpha]_D^{23}$ (2, $CHCl_3$)	*N*-*t*-Butoxycarbonyl derivatives **4b** Yield [%]	m.p. (dec)	Lit. m.p. and/or Molecular formula[a]	$[\alpha]_D^{23}$ (2, CH_3Cl)
L-Leu	$-CH_2-CH(CH_3)_2$	90	oil[c]	oil[2]	− 3.0°	83	76–77°	70–72°[8]	−16.6°
L-MeLeu		86	oil	$C_{30}H_{40}N_2O_7$ (540.6)	−39.0				
L-Ile	$-CH(C_2H_5)CH_3$					55[d]	68–69°	77–79°[8]	−32.8°

SYNTHESIS
International Journal
of Methods in
Synthetic Organic Chemistry
1978

Authors' Guidelines

I. Review Articles

Potential authors are asked to contact Prof. G. Schill or Prof. G. Sosnovsky before submitting a manuscript in order to avoid disappointment or exceptionally long delays in publication.

The subject matter which might be acceptable is almost unlimited provided that the emphasis is on practical methods in synthetic organic chemistry. The article should give either a complete description of the methods which have not been previously reviewed or a critical evaluation of new developments to known methods. The manuscript should be written in the style currently used in SYNTHESIS and should include as many up-to-date, key references as possible. Language of publication is English or German.

In addition to the suggestions given in Section III, the following points should be followed during the preparation of manuscripts for review articles:

1. The manuscript should not exceed 40 pages (DIN A4 or Quarto), including references, formulae, and tables, typed with double spacing (~15–20 printed pages). Longer articles may be accepted under exceptional circumstances; however, publication of such articles may be delayed until sufficient space is available.
2. The methods described must be illustrated by detailed descriptions of the experimental procedures involved. These should preferably be unpublished or be selected from less common sources. A critical evaluation of the methods should be given whenever possible.
3. Discussion of theory and mechanism should be limited to the minimum necessary for a clear understanding of the reactions under consideration. Historical background should be avoided or restricted to a minimum.
4. Clear reaction schemes (not only individual structures) should be given and tabulation of critically selected analogous results made whenever possible.
5. Each review article must be preceded by a table of contents and a concise abstract reflecting accurately the subject matter.
6. Only in exceptional cases should the author restrict the presentation to his own work.
7. As complete literature references are given the additional quotation of authors' names in the text should be avoided.
8. The material contained in previous review articles should be considered and repetitions avoided wherever possible.
9. No fees are paid to the authors of Reviews or Communications nor are page charges levied.

II. Original Communications

Manuscripts (3 copies should be submitted) for original communications should not exceed 6 pages (DIN A4 or Quarto) typed double spaced and may be submitted to the editorial office or one of the three editors. Language of publication is English or German.

The style of communications currently published in SYNTHESIS should be followed. Clear reaction schemes (not only individual structures), tabulations of results, and detailed descriptions of the experimental procedures are essential. The scope of the methods described should be illustrated by several examples. A limited discussion of reaction mechanisms should only be included if it contributes to the clarity of the presentation. The suggestions given in Section III should be followed as closely as possible.

Manuscripts dealing with the following topics are invited for submission as communications in SYNTHESIS.

1. *Description of new synthetic methods:* advantages of the new method over the presently existing methods for the same process should be indicated and the scope and limitations of the new method should be indicated by several examples.
2. *Description of significantly improved synthetic methods,* advantages of the new development over currently used methods should be clearly demonstrated by parallel experiments under similar conditions.
3. *New and/or improved preparations of key intermediates, or of new classes of compounds.* Potential applications of the key intermediates should be indicated briefly.

Manuscripts describing syntheses of *new* compounds by *known* methods will not be accepted. Exceptions may be possible in cases of important key intermediates or new classes of compounds. Also manuscripts describing methods which may be described as new but which are, in fact, directly analogous to known methods may not always be accepted.

The Editors reserve the right to reject manuscripts which they consider deal with topics of too specialised interest and which would be more suitably published in an appropriate specialist journal.

Communications which are accepted for publication will be published as rapidly as is technically possible. It is therefore of interest to readers and authors that all manuscripts be concise and in accord with the directions given here.

Manuscripts from authors whose mother language is not English or German will be checked carefully and corrected where necessary by the editorial staff; this may lead to some delay in publication.

III. Preparation of Manuscripts

Language of publication of Reviews and Communications is English or German:

1. Three copies of the manuscript should be submitted. The manuscript should be typed double spaced; indentations and underlinings should be avoided (except for complicated cases, as in sugar chemistry, where the type of script to be used may be indicated by underlining). In the case of manuscripts with more than one author, the author to whom correspondence is to be addressed should be indicated (*).

2. The nomenclature used should be based on the systematic rules adopted by *Chemical Abstracts* (Index Guide Vol. 76), *Ring Index* and *Supplements* (American Chemical Society, 1959–1965), IUPAC (*Nomenclature of Organic Chemistry*, Parts A, B & C, Butterworths, London, 1969) etc. Trivial names should be avoided unless they are definitely advantageous over the corresponding systematic names.

3. Whenever possible, clear formulae (reaction schemes are to be preferred to individual structures) should be given for the reaction described. Freehand drawings of organic structures are acceptable. However, it is emphasised that the presentation should be clearly and neatly carried out.

   Note: for iodine, the sign J is used, not I (for reasons of clarity, as the capital I is identical with the Roman numeral I and in some types of script also with the small letter l and the numeral 1).

4. In the presentation of tables, the form of the tables already published in SYNTHESIS should be followed.

5. Experimental procedures should be concise but contain all essential data referring to performance of the reaction and isolation of products. For all compounds prepared, yields of isolated product should be given (amount and percentage based on starting material). Manuscripts in which yields are not given or in which yields are estimated only by G.L.C. or by spectral methods may not be accepted. When the preparation of a series of similar (e.g. homologous) compounds is described, a general procedure should be given and the data for the individual compounds presented in tabular form.

Example:

4-Oxo-4,5-dihydrofuro[2,3-c]quinoline:
A solution of furan-2-carboxanilide (200 mg, 1.07 mmol) in a mixture of benzene (180 ml) and ethanol (20 ml) is irradiated with a 100 Watt high-pressure mercury lamp at room temperature for 10 h. The solvent is removed in vacuo and the residue separated by preparative T.L.C. on silica gel using benzene/ethyl acetate (4:1) as eluent; yield: 50 mg (25 %); m.p. 282.5 – 283° (from ethanol).

$C_{11}H_7NO_2$ (185.2) calc. C 71.35 H 3.81 N 7.56
found 71.16 3.88 7.49

M.S.: m/e (relative intensity) = 185 ($M^{\oplus}$, 65), 156 (34), 129 (100), 102 (78).

I.R. (Nujol): ν_{max} = 3150, 1680 cm^{-1}.

U.V. (ethanol): λ_{max} = 218 (ε = 67 000), 258 (8 900), 308 (9 100), 320 nm (7 300).

^{1}H-N.M.R. (DMSO-d_6): δ = 8.10 (s, 1H), 7.94 (d, 1H, J = 7 Hz), 7.50 (s, 2H), 7.33 ppm (s, 2H).

Further example for the presentation of N.M.R. data:

^{1}H-N.M.R. ($CDCl_3$): δ = 8.2 (s, 1H, -N=CH-), 6.9 (s, $1H_{arom}$), 6.61 (s, $1H_{arom}$), 3.69 (m, 4H, $-CH_2-CH_3$), 3.49 (d, 6H, $-OCH_3$, J = 3 Hz), 0.81 ppm (m, 6H, $CH-CH_3$).

For new compounds (which should be clearly indicated as such), sum formulae, molecular weights to 1 decimal place, and microanalyses (where possible) and characteristic physical and spectral data should be given. In order to save space, microanalysis data in tables may be removed *by the editorial staff* and replaced by a footnote "All compounds gave satisfactory microanalysis (C±0.3%, H±0.14%, etc)". I.R. absorptions must be given in wave-numbers ν[cm^{-1}], not in wavelengths, λ; U.V. data in wave lengths λ[nm]; and N.M.R. data in δ values, not τ values. For all spectral data, the solvent used must be given. For known compounds physical data with comparative literature values should be given. Corrected values should be given for all melting and boiling points.

6. In the text, full chemical names should be used instead of formulae whenever possible (e.g. hydrogen chloride or hydrochloric acid, respectively, not HCl). In certain cases, however (e.g. complexes having complicated names) formulae will be accepted.

7. The following abbreviations should be used:

Groups (to be used in formulae):

A	Groups such as $-(CH_2)_n-$, $-C_6H_4-$, and hetero analogs
M	Metal
R	(preferentially) C-Substituents
X	Halogen, OR, NR_2, SR, etc. (monovalent)
Y	O, S, NH, etc. (bivalent)

and the abbreviations used in peptide and sugar chemistry.

Methods

C.D.	Circular dichroism
E.S.R.	Electron-spin resonance spectrum
G.L.C.	Gas-liquid (partition) chromatography
H.P.L.C.	High pressure liquid chromatography
I.R.	Infra-red spectrum
M.S.	Mass spectrum
N.M.R.	Nuclear magnetic resonance spectrum
N.Q.R.	Nuclear quadrupole resonance spectrum
O.R.D.	Optical rotatory dispersion
T.L.C.	Thin-layer chromatography
U.V.	Ultra-violet spectrum

Measures

nm	nanometer
mm	millimeter
cm	centimeter
m	meter
mg	milligram
g	gram
kg	kilogram

ml	milliliter
l	liter
mmol	millimole(s)
mol	mole(s)
equiv	equivalent
sec	second
min	minute
h	hour
torr	torr (mm Hg)
atm	atmosphere (do not use "psi")
°	degree (temperature); note: ° implies °C (C is deleted)

Miscellaneous (to be used in formulae, experimental procedures, footnotes, tables etc.)

b.p.	boiling point
m.p.	melting point
subl.p.	sublimation point
r.t.	room temperature (only in formulae and tables)
Mol. weight	Molecular weight
∇	heating (only in formulae)
ϕ	diameter

8. References should be placed collectively at the end of the article or communication. They should be numbered consecutively. Subdivisions such as 3a, 3b should be avoided. It is requested that the references be checked carefully before the manuscript is submitted. In quotations with more than four authors, only the name of the first author is given with the addition "et al.". Journal abbreviations should be in accord with *Chemical Abstracts* practice (see *Bibliographic Guide for Editors and Authors*, American Chemical Society, 1974).

Examples:

[1] G.H.Williams, Homolytic Aromatic Substitution, Pergamon Press, London, 1970, p. 42.

[2] H.Viehe, Z.Janousek, Angew. Chem. 83, 614 (1971); Angew. Chem. Int. Ed. Engl. 10, 573 (1971).

[3] M.Černý, J.Málek, Tetrahedron Lett. 1969, 1759.

[4] M.D.Scott, J. Chem. Soc., Perkin Trans. 1 1972, 1432.

[5] A.M.Knowles et al., J. Chem. Soc. [C] 1971, 598.

[6] N.L.Burde, L.V.Alekseeva, B.N.Lundin, Zh. Obshch. Khim. 38, 439 (1968); J. Gen. Chem. USSR 38, 434 (1968).

[7] F.Eloy, R.Lenaers, C.Mousseboix, U.S.-Patent 3 227 725 (1966), Union Carbide Corp.; C.A. 64, 9736 (1966).

9. The use of footnotes referring to the text should be avoided if possible. Footnotes should be numbered consecutively with the references throughout the manuscript. Footnotes may be used for tables and should be designated as a, b, c, etc.

10. Whenever possible, copying of drawings and graphs from other journals or printed matter should be avoided. It is the task of the author to obtain permission for the reproduction of such figures.

11. Acknowledgements may only be made for financial support, essential gifts of chemicals or apparatus, and performance of essential parts of the work (elemental analyses, spectra, etc.) by other firms, institutions, etc. The acknowledgements should be kept as brief as possible and placed at the end of the manuscript. Similarly, dedications should be brief and placed at the end of the manuscript.

IV. Galley Proofs

Galley proofs will be sent to the authors for correction. They should be returned as soon as possible to the editorial office. Please note that the signs XXXXX, 00000, ▮▮▮▮▮▮▮, ???????, etc. indicate that something was missing or unintelligeable in the manuscript and the pertinent information should be added during correction.

It is requested that corrections be limited to the elimination of printing errors. Alterations and expansions are to be avoided for reasons of increased costs. The proof sheets are not indicative of the quality of the print. This applies particularly to the lay-out of tables. Due to the particular mode of setting, the corrections of misspellings are expediently carried out at the same time as the author's corrections.

Fifty (50) reprints of each article will be supplied free of charge. These will be shipped after publication of the journal issue. An order form for further reprints (in increments of 50) will be sent with the galley proofs and should be returned with the corrected proofs even when additional reprints are not required.

V. Für Autoren deutscher Arbeiten

Für deutsch-sprachige Arbeiten gelten die vorstehend aufgeführten Richtlinien in gleicher Weise. Die Autoren werden gebeten zu beachten, daß bei den Arbeitsvorschriften die Mengenangaben immer in Klammern hinter die betreffenden Verbindungen gesetzt werden; Angabe der Ausbeute in erhaltener Menge und % der Theorie. Die Anordnung der Analysen-Daten und der spektralen Daten erfolgt ebenfalls wie im obigen englischen Beispiel angegeben. Die Nomenklatur wird weitgehend der *Chemical Abstracts*- und *IUPAC*-Nomenklatur angeglichen; z. B. Chloroalkan, Bromocyclohexan, 4-Cyanopyridin, Alkyn, usw.

Autoren werden auch auf die deutsche Fassung der IUPAC-Regeln [*Internationale Regeln für die chemische Nomenklatur und Terminologie, Deutsche Ausgabe*, H. Grünewald (Hrsg.), Verlag Chemie, Weinheim/Bergstr., 1975] hingewiesen.